



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

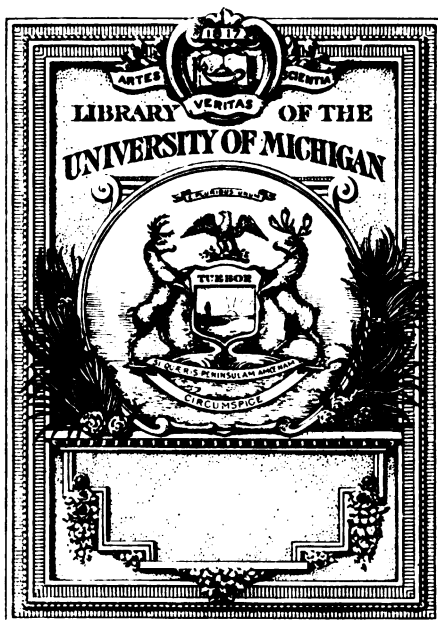
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

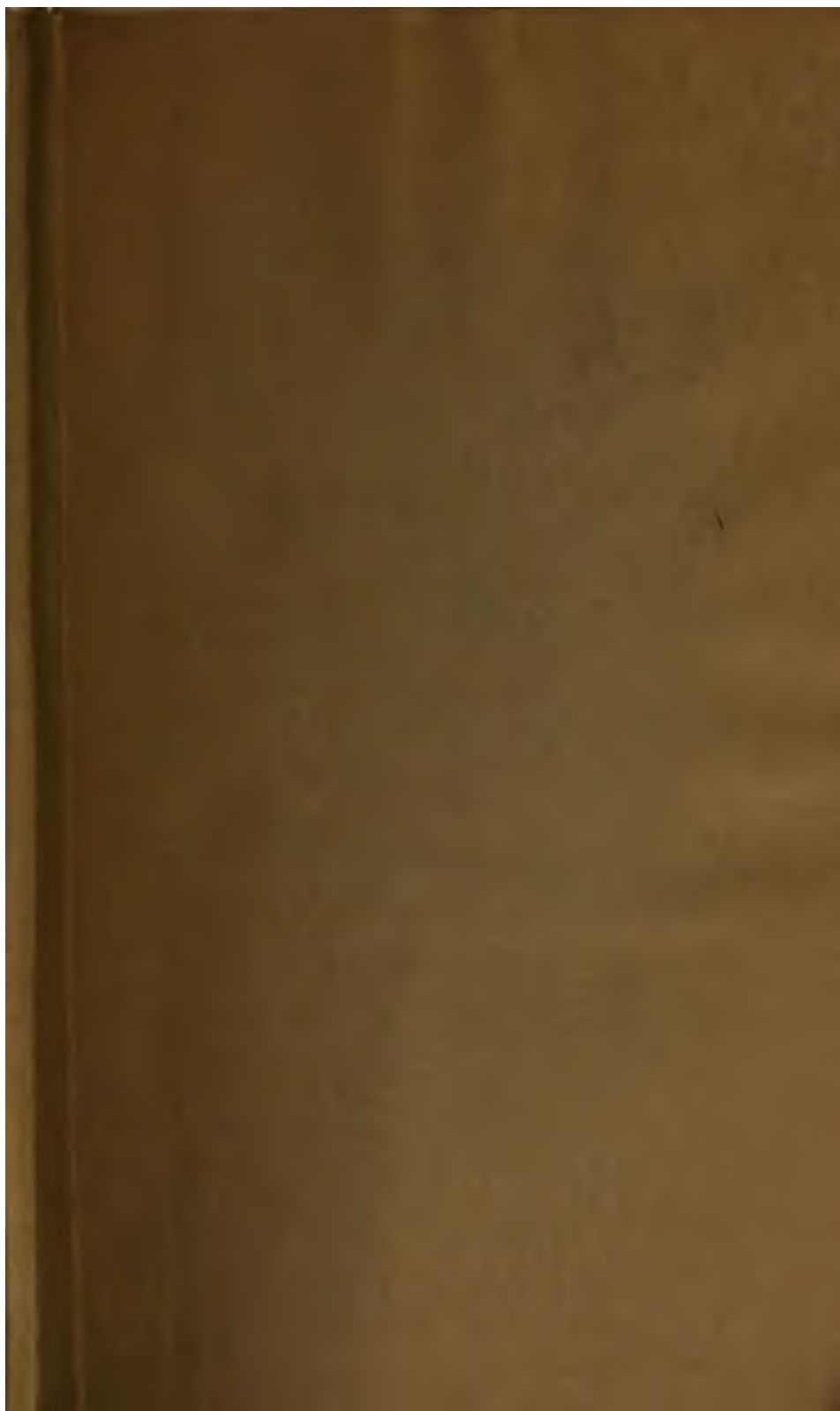
We also ask that you:

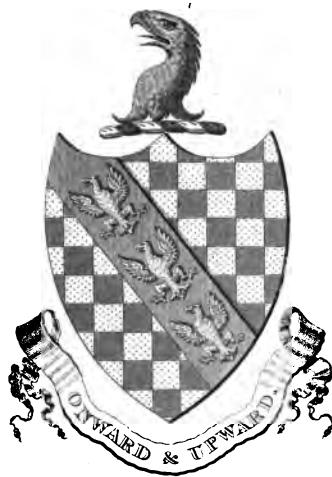
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>







John Harvard.

THE ANALYST;
▲
QUARTERLY JOURNAL
OF
SCIENCE, LITERATURE,
NATURAL HISTORY, AND THE FINE ARTS.

EDITED BY
WILLIAM HOLL, Esq., F.G.S.; E. MAMMATT, Esq., F.S.A.;
AND
NEVILLE WOOD, Esq.,
(AUTHOR OF "BRITISH SONG BIRDS," "ORNITHOLOGIST'S TEXT BOOK," &c.)

VOL. VII.

LONDON:
SIMPKIN, MARSHALL, & CO.
WHYTE & Co., EDINBURGH; BARLOW, BIRMINGHAM.

1837.

AP
4
.A53

11/11/13



cont.
Schwab
3-27-45
52152

THE ANALYST.

SEBASTIAN BACH AND HIS WORKS.

To make the English public better acquainted than it at present is with the name of a great composer—to promote investigation, serious study, and frequent performance of his works, and thus to improve the taste of both the connoisseur and amateur—are the objects of the present article. That the name of Sebastian Bach is scarcely, or at least by far too little, known in England—that his works are never heard at the great festivals, and very seldom, if ever, at the public concerts—are lamentable facts, we confess, and facts which speak but ill for the state of musical cultivation in our country. But the causes which have been, and still are, active in producing such culpable indifference, are, we think, by no means difficult of discovery. In the first place, Bach was never in England. This alone, in the hitherto existing and present state of musical knowledge in this country, is sufficient to account for his works not having received a much larger portion of that attention and admiration which, if the truth were known, they merit, to the exclusion of almost all others. The reverence in which we English hold the works of Handel is well known. And why this? Because they surpass all others in grandeur, beauty, and ideality of conception, in finish and elaborateness of execution? Oh, no! But simply because he had the good fortune to spend a great part of his life in our favoured isle, and there to produce his great works. This, without periphrasis, is one great constituent in the excessive and often ridiculous veneration in which the name of Handel is

held.* He is *our* Handel, belonging, we fondly imagine, to none but ourselves; *we* alone can understand him. Foreigners must be content with their Leos, their Pergolesis, their Bachs, their Grauns, and a host of other composers, respectable, no doubt, but not to be named in the same breath with our idol, our own peculiar treasure, the "giant Handel." And this because, instead of in Germany, he lived and wrote in England;† because he composed in a fog instead of under a blue sky; and because he gratified English self-love by setting his music to English words. All this, doubtless, is contemptible enough; but, contemptible as it is, such is the fact: we do but state it, in the hope that people, now knowing the seat of the disease, will set about removing it with all diligence.

Another cause of the neglect we are complaining of lies deeper, but will be equally apparent when we have explained, further on, what are the characteristics of Bach's music. At present we will only state, and that without fear of contradiction, that it is his surpassing excellence, his entire freedom from the pedantic and conventional observances of inferior minds, his independent boldness of imagination, which dared and performed every thing worthy of being performed, and, above all, the elevated ideal which was continually present to his mind, which has hitherto opposed effectual barriers to his just appreciation and extended fame. Let not these barriers any longer prevail; let us break through the trammels in which ignorance, self-esteem, and prejudice, have hitherto confined us, and resolve to seek out, and when found to appreciate, whatever is noblest and most elevated in the art; not to remain satisfied with any degree of excellence as long as there exists one yet more excellent, nor to pride ourselves on a one-sided admiration of any composer, resulting more from ignorance of his rival's than from due estimation of his own merits.

Another and the last cause which occurs to us is, the unreflecting readiness with which most men bow down before authority—in

* We yield to none in a rational admiration of Handel; but what we mean to assert is, that his almost exclusive celebrity in this country is owing rather to adventitious and extrinsic circumstances than to admiration arising from a knowledge of the merits of other composers, and his superiority over them. Besides this, Handel was essentially a popular composer—that is, he adapted his undoubtedly great powers to the capacities of uncultivated tastes; and inasmuch as he has done so has he lowered his claims to rank as a great artist, in the highest acceptance of the term.

† Handel composed the *Messiah* at Gopsall, the seat of Earl Howe, in Leicestershire. There is a good portrait of the "gigantic" melodist in the earl's collection at this family residence.—EDS.

other words, before the dictum of individuals. Now such a dictum, to be at all valuable, must proceed from one really competent to judge of the point on which he decides. We must, before we regard him as an authority, first ascertain that he has given the subject mature consideration, and then that, having done so, his mental faculties and their cultivation are such as will enable him to decide in a satisfactory manner. This mode of inquiry, however, even when properly conducted—which, unfortunately, it seldom or never is—furnishes us at best with a probability only, by no means with a certainty. Thus, the more attention any one has bestowed on a given subject the more *likely* he will be to give a correct opinion with regard to it; but that he *should* do so is altogether uncertain, for this simple reason, that the wisest and least prejudiced of mortals is liable to error, and if so, how are we to be satisfied that the very point to be determined is not that in which he will err? It is simply seeing with the eyes of others and neglecting the use of our own. No, no! see with your own eyes, hear with your own ears, and think with your own minds; use the faculties of others only to consult, not to follow their dictates. Let this be your rule in every matter, as well of opinion as of taste, and your safe-guard against the undue influence of authority. Almost all whom the English public has been accustomed to look up to on the subject of music, have either dismissed the name of Bach with a sneer, or else have awarded him so small a share of praise as almost to produce the same effect upon the reader. To adduce an example or two: Burney, in his *History of Music*, condescends to assign our author a niche in the temple of fame, with the limitation, however, that he would have merited one more honourable *if he had been more assiduous in courting popular applause!* This is the dictum of one of the wise ones by whom the public has been “tenderly led by the nose, as asses are.” Dr. Crotch, of whom one should have expected something very different, owns that Bach's *Preludes and Fugues* are the finest ever produced, and that after hearing them almost all other music appears common and insipid; but, almost in the same breath, the Doctor dismisses his vocal works with the very negative praise that they are inferior to Handel's, and the equally positive accusation—which we shall, in the sequel, prove to be unfounded—that they are wanting in variety of excellence. Such a charge can only come from one who is either unable or unwilling to see things and judge of them as they exist, unless they contribute to the glory of a pre-established favourite. We have brought these two examples, in one of which the weak point of a really great man is con-

spicuously shewn, to confirm our position that the verdict of critics has hitherto been, if not always directly hostile, at least nugatory, to the reputation of Bach, and that this is one of the causes of the neglect by the public of the greatest composer who ever existed.

Far be from us the wish to set ourselves up as dictators in the place of any one. What we desire is, by inducing every one to reason, investigate, and admire with his own faculties, to undermine the power of all dictators whatsoever. If we shall have prevailed upon one only of our readers to work this hitherto neglected mine, and thereby be the mediate cause of his finding an inexhaustible store of intellectual wealth where he only expected labour and sorrow, we shall deem ourselves amply repaid for the time and space we have devoted to the subject; if upon more, so much the greater will be our reward. We now proceed to give a sketch of our author's life.

John Sebastian Bach* was born on the 21st of March, 1685, at Eisenach, where his father was musician to the court and town. He lost his mother before he was ten years of age, and his father shortly after. Thus early left an orphan, he was obliged to have recourse to John Christopher, his elder brother, organist at Odruff, from whom he received his first instructions in playing the clavi-chord.† He soon became master of the pieces set before him by his brother, and, indeed, made such rapid progress as to excite his jealousy. The following anecdote is a striking instance of pitiful meanness on the one side, and dauntless perseverance on the other. Sebastian Bach had observed, in his brother's possession, a book containing the works of most of the celebrated clavichord composers of the day, and earnestly begged permission to profit by its contents. The refusal he received only increased his desire to possess the forbidden treasure. This he accomplished by passing his little hands through the interstices of a lattice door which barred his access to the object of his desire, rolling up the book, and thus bringing it forth to the light of day. He now set about copying its contents; but being obliged to use the greatest secrecy, and not being allowed the use of a candle, he was under the necessity of employing the light of the moon for this purpose. Thus was this child of genius

* These particulars are extracted from the life of our author by Dr. Forkel, a work which we cannot too often recommend to our readers. We must warn them, however, that they will find none of the gossiping details which occupy so much space in the popular biographies of Haydn, Mozart, and Rossini, and which to some, we fear, form their chief attraction.

† The forerunner of the harpsichord.

and industry engaged during six entire months, when at length he thought himself safely possessed of his treasure ; and, while pleasing himself with the idea of making good use of it in secret, his brother discovered it, and without pity deprived him of what had cost so much labour. Yet, though his hopes were thus cruelly blighted, his toil was not without its reward. During his solitary moonlight vigils, with no other incentive than his enthusiasm, no other solace than the consciousness of his rising powers, he had been laying the foundation of that mighty edifice which was destined to astonish the world, and to endure, for countless ages, the admiration of all beholders, the envy and despair of all rivals.

Shortly after this, being again left destitute by the death of his brother, he went, in company with one of his schoolfellows, to Lünberg, where he engaged in the choir of St. Michael's School, as a soprano singer. His fine voice procured him here, for a short time, a good salary ; but losing it soon, and not immediately acquiring one equally good in its stead, with it he lost his lucrative situation. His inclination to play on the clavichord and organ was at this time as ardent as in his earlier years, and impelled him to see and hear every thing which he thought could, in any way, contribute to his improvement. With this view, he not only went several times from Lünberg to Hamburgh, to hear the celebrated organist John Reincken, but also to Zell, in order to become acquainted with the prince's band—which consisted chiefly of Frenchmen—as well as with the French taste, which was then entirely new to him.

In 1703, when only eighteen years of age, he was made court musician at Weimar. This appointment, however, he exchanged in the following year for that of organist to the New Church at Arnstadt ; probably to follow his inclination for playing on the organ with greater facility than he could at Weimar, where he was only engaged to play the violin. Here he began most zealously to make use of all the works for the organ at that time celebrated, for the purpose both of improving himself in the art of playing on that instrument, and in that of composition.* So ardent was his zeal, and so great his resolution to leave nothing undone which could be done towards the furtherance of this object, that he even made a

* If musical composition were considered an art instead of a science, we should have, instead of treatises without end and theories without number, a more useful, a more practical, musical education. It is through practice alone, not through theory, that art can be improved and elevated. How far the world in general is from this view of the subject it is needless for us to say.

journey on foot to Lubeck to hear the organist of St. Mary's Church in that city, with whose compositions he was already acquainted. For almost a quarter of a year he remained a secret hearer of this organist, and then returned to Arnstadt with an increased stock of knowledge.

The efforts of his zeal and unwearied diligence were followed by their appropriate reward. He received, in rapid succession, several offers of places as organist, and in 1707 he accepted that of St. Blasius, at Mühlhausen. A year, however, after he had done so, making a journey to Weimar to perform before the reigning duke, his execution on the organ was so highly approved of that he was offered, and accepted, the place of court organist. The extended sphere of action, with regard to his art, in which he here moved, impelled him to exert himself to the utmost; and it was probably during this period that he made himself the unrivalled performer he was universally allowed to be. He had still further occasion to improve himself when his prince, in 1717, appointed him director of the concerts, in which office he was expected to compose and perform pieces of sacred music.

Bach was now thirty-two years of age; he had made such good use of his time, had studied, composed, and played so much, and by unremitting diligence had acquired such a mastery over every principle of his art, that he stood, like a giant, able to trample all around him into dust. He had long been regarded, not by amateurs only, but by judges of the art, with wonder and admiration, when, in the year 1717, M. Marchand, who had attained considerable celebrity in France as a performer on the clavichord and organ, came to Dresden, where he played before the king with such success that a large salary was offered him if he would engage in his majesty's service. Volumier, at that time director of the concerts in Dresden, knowing Bach's superiority, in all respects, over the Frenchman, wished to procure a public contest between them, in order to give his prince and the inhabitants of Dresden an opportunity of judging of their respective merits. With the consent of the king, accordingly, a message was dispatched to Sebastian Bach, at Weimar, inviting him to this trial of skill: he accepted the invitation, and immediately set out on his journey. On his arrival in Dresden, Volumier procured him an opportunity of hearing Marchand play unobserved by the latter; and Bach, nowise discouraged by what he had heard, sent to the French artist a polite note, formally inviting him to the trial of their powers; offering to play without preparation whatever the other might please to set before

him, but requesting the same readiness on his part. Marchand having accepted the terms, and the time and place having been arranged, a large company, of both sexes and of the highest rank, assembled. Bach did not keep them long waiting, but Marchand failed to appear. On inquiry, it was ascertained that he had left Dresden that morning, without taking leave of any one. The whole of the performance, therefore, devolved on Bach, who excited the astonishment and admiration of all who heard him. Volumier's intention, however, to show in a striking manner the superiority of German art, was frustrated, though certainly the cause of that frustration was far from discreditable to Bach's powers and reputation.

In the year 1723 he was appointed music director to St. Thomas's School at Leipzig, where he remained till his death. Whilst in this situation he received the title of chapel master to the Duke of Weissenfels, and in the year 1736 that of court composer to the King of Poland.

The indefatigable diligence with which, particularly in his earlier years, he had frequently passed days and nights without intermission in the study of his art, had weakened his sight. This weakness continually increased towards the close of his life, till at length it terminated in a painful disorder of the eyes. Having been persuaded to apply to an oculist who had arrived in Leipzig from England, he submitted to an operation, which, twice proving unsuccessful, not only wholly deprived him of sight, but, conjoined with the probably noxious medicines which he took, completely undermined his hitherto vigorous constitution. For more than half a year after this he continued to decline, when, on the tenth morning before his death, he suddenly regained his sight. This, however, was only the last flicker of the dying flame: within a few hours he was seized with an apoplectic fit, followed by an inflammatory fever; and his enfeebled frame being unable to bear up under such a complication of disorders, he shortly after breathed his last, on the 30th of July, in the 66th year of his age.

Such was the life of this truly great man—a standing rebuke to many pseudo-musicians of the present, and it is to be feared of all times, who, by Nature endowed with a certain degree of talent, imagine that all the rest may be left to chance; who go through a certain—generally unprofitable—routine of study, and think they have done all that is necessary towards acquiring a mastery of the art; whose ideal, if they have any, consists in what they feel themselves competent to produce, not in what they feel they ought to produce; and who are not ashamed of sending forth to the world

works conceived without consideration and executed without study. Here we have the rare and noble example of a man naturally possessed of musical powers, greater, perhaps, than have ever been enjoyed by any single individual, engaged in diligent and unremitting study from early childhood to the close of his long career, never for one moment losing sight of the degree of excellence he wished to obtain, though he knew it unattainable, and consequently always making advances towards it. He who is satisfied with what he has already performed, and looks to no further improvement, does but shew how unworthy is his idea of what ought to be accomplished, and how contemptible his ambition. The essence of true genius is to keep in view a nobler, a more ethereal, sphere of action than is ever dreamt of by common minds—to regard what is already attained only as one step in advance towards the regions of perfect purity, of perfect beauty, in which alone it lives, and moves, and has its being. Can he who is endowed with such a genius ever rest in his glorious career?—ever console himself with the idea that he has done more or better than his rivals?—ever relax his efforts to fulfil the ideal on which his mind's eye continually rests? No! for rest implies satisfaction; and he is not, cannot be satisfied: no! for he disdains comparison with aught but his own elevated ideas of perfection: no! for he longs—he thirsts—for that perfection as the hart panteth for the water-brooks, and he knows that his utmost efforts can only *approach* him to the wished-for end, never enable him to attain it. Such is the essence of true genius—such its constitution; in this exists its difference from, its superiority over, that by no means uncommon talent (for it merits no higher designation) of retailing other men's ideas in a novel garb, accompanied by complete satisfaction at what it has produced, and by not the slightest desire for anything higher, anything nobler.

A correct edition of Bach's works, from the first effort of his infant muse to the last production of his genius, would, if arranged in chronological order, not only prove highly interesting to those who delight in watching the progress and internal development of the human mind, but would without doubt be in a great measure conducive to the revival of the art from that stagnation, that hopeless inanity, which, in this country at least, if not in others, is its unfortunate characteristic. Beautiful it is, in spring time of the year to see all Nature rising forth, as it were, from the bleak and dreary abyss of winter, unfolding herself before our eyes in all her loveliness and grandeur, and assuming various shapes, various dispositions, every one of them perfect, every one inimitable. More

beautiful still, to watch the development of the "human form divine" in its advance from helpless, shapeless infancy to the spring-tide of youth and beauty, a being but a little lower than the angels—the most perfect of his Creator's visible works. How far more beautiful, then, than either, to mark the progress of *mind*, the image and reflex of that Creator, from its first timid and unequal flight, to its subsequent sublime soarings in the ethereal regions of boundless space, of infinite perfection—the foretaste of what every one shall enjoy in an ever-happy, ever-during world! The work which assists us in researches of this nature, does more for human improvement, for human happiness, than thousands of the aimless, and therefore abortive, attempts of the present day, which men in their ignorance and their folly designate as art.

In the absence of a guide, such as we have referred to, we must rest satisfied with the sources of information and enlightenment which lie before us. Of all Sebastian Bach's voluminous works, we are as yet acquainted with eleven only, besides the preludes and fugues for the organ, now publishing in this country. Of these latter we shall merely say, that, exhibiting as they do a mastery over the art, unattained by any but our author, yet many of them bear faint traces only of the excellence at which he arrived during the last twenty years of his life: we therefore refer them to a time when his powers were already gigantic, but his judgment yet un-matured.*

* On this subject Forkel observes:—"Only uninterrupted practice can lead to true excellence. But if we were to pronounce all the works produced during this practice to be master-pieces, because master-pieces at length proceed from it, we should greatly err. This is the case with Bach's works. Though we find, in his earlier attempts undeniable evidences of a distinguished genius, yet they contain at the same time so much that is useless, poor, and extravagant, that they are not worth preserving—at least for the public in general; and, at most, may be interesting to the connoisseur who wishes to make himself acquainted with the course which such a genius has followed from the commencement of its career. For the separation of these attempts, or juvenile exercises, from the real master-pieces, Bach has himself given us two means, and we have a third in the art of critical comparison. At the appearance of his first work he was above forty years of age. What he himself, at so mature an age, judged worthy of publication, has certainly a presumption in its favour that it is good: we may therefore consider all the works which he himself had engraved to be extremely good. With respect to those among his compositions which circulate only in manuscript, and which are by far the greatest number, we must have recourse, in order to know what is worth preserving, partly to critical comparison, partly to the sound means which Bach has given us. Like all really great geniuses, he

The *Forty-eight Preludes and Fugues* form a master work unique of its kind. He who knows only the fugues of the greatest of other composers cannot possibly form any idea of the pitch to which this art may be brought, of the ends to which it may be adapted, or of the feelings which it may excite. Of the fugues of other composers, he who knows one knows all, and can play all ; but each of Bach's fugues is a study of itself, and *requires* separate study properly to understand it. A characteristic and, at the same time, a beautiful subject, a delicious and equal flow of melody in all the parts, complete connection between the ideas, so that one seems necessarily to arise from the other, a bold and ever-varying modulation, perfect conformity of each part to the whole, and the result of all these, the highest degree of ease and freedom, of sublimity and beauty, of which the heart is capable—these are the distinguishing features of Bach's fugues. To say that they break through many of the (at that time) recognized rules of musical composition, is only saying that they opened new and hitherto untrodden paths of harmony and melody, which, once discovered, lead us through scenes of beauty and loveliness of which before we could form no idea. It is generally imagined that harmony and melody are totally independent branches of the art, and that the one may be perfected without the aid of the other. This is only partially correct, for while melody may acquire considerable excellence without the intervention of harmony, the latter improves only in proportion to the improvement of the former : in short, melody is nothing but a constituent part of harmony, which only arrives at its highest excellence by a judicious union of well-conceived and well-amalgamated harmonies. This union of melodies equally scientific and poetical is the essence of all Bach's harmonies ; this it is which makes his works the admirable models they are. He is almost the only composer we are acquainted with who, taking this principle as his starting-post,* carries it out, fearless of the difficulties it in-

never laid aside the critical file in order to make his fine works still finer. Any of his early works that were at all susceptible of improvement he improved. The desire to improve was extended even to some of his engraved works. Under this head I reckon the most of what he composed before the year 1725. A great many later compositions, but which, for reasons easily understood, are likewise known only in manuscript, bear too evidently about them the stamp of perfection to allow us to doubt whether we shall number them among the essays or among the works of the accomplished artist."

* Weber, in his *Euryanthe*, has shewn what may be achieved in secular music by following this principle : but, in consequence, this master-piece of art

volves in its execution, and who shews in that execution that he is fully capable, not only of surmounting those difficulties, but of surmounting them with grace. The preludes, possessing as they do the same excellencies, the same beauties, and the same highly poetic feeling as the fugues, form, together with these, a treasure of art, a mine of wealth, which we can never study too deeply, never value too highly.

The world has never yet seen the instance of a great and original instrumental composer who has not also excelled in writing for voices. The means which are employed, the resources which are required for both, are essentially the same; they vary only in the mode of their adaptation to a proposed end. Can it be supposed, then, that he who excelled all rivals in the one, should not also be equally superior in the other? Such a supposition can only proceed from one possessed of partial and incorrect notions of the art. He who asserts that Bach's instrumental works exhibit variety, learning, and sublimity unsurpassed and unsurpassable, will be required to prove that the resources which, in instrumental music, have been employed to produce the highest excellence, become, when applied to vocal writing, in a measure unavailable to the same end. To do this is impossible; we are accordingly favored with the assertion only, not with the proof. As such, let us receive it, and proceed without delay to its refutation, as one detrimental, not only to the fame of him against whom it is directed, but also to the interests and advance of the art to which it relates.

Sebastian Bach's vocal works—all, so far as we are aware, devoted to sacred subjects—may be divided into those written for the Protestant, and those for the Roman Catholic, form of worship. This arrangement in the examination of his works is purely one of convenience, for the stamp of his exalted genius is to be found in all alike: of his compositions adapted to German words we are acquainted with seven only. We now proceed to their examination.

No. 1. *A Litany, after the Text of Martin Luther.*—This is a master-work, evincing, in its fullest extent, all the learning and sublimity of its author. It consists of one movement in D minor, with orchestral accompaniments. The alto, tenor, and bass voices, move easily and unconstrainedly in free canon, whilst the soprano makes the subjects that have been proposed by the other voices be

must wait for general appreciation till the time when music is cultivated as an art, and not as a mere idle amusement.

heard by augmentation. The accompaniment, which is such in the strictest sense of the term, and not a mere replicate of the voices, completes the harmony by traits of melody and imitation totally distinct from, yet perfectly in character with, the vocal parts. The boldest forms of progression—forms which our author alone ever attempted—are here employed with startling yet sublime effect. Nothing vulgar, nothing commonplace, nothing even beautiful, is admitted to profane this holy of holies; here all is grand, dignified, and majestic. Such was the idea entertained by this great man of the duties of the sacred composer—thus nobly has he fulfilled them.

2. *Herr deinen Augen sehen nach den Glauben.*—This piece consists of a chorus for four voices, with orchestral accompaniments distinct from the vocal parts; two airs, the one for a bass, the other for a tenor voice; an accompanied recitative, and two chorals.* The bass song is perfect of its kind; and being highly characteristic of Bach's manner of writing for single voices, we will now take the opportunity of explaining in what that manner consists, and in what it surpasses that of other composers. It is the common practice to make the voice the principal, nay, the sole interesting part, and to give the accompaniment only such secondary importance as may suffice to bring out the solo into the greatest possible relief. If nothing more than the good pleasure of the singer be desired, this is certainly the best way of obtaining it. If, again, the uninstructed in musical science are alone to be taken into account, the principle usually acted upon is still, undoubtedly, to be lauded. If, on the other hand, we regard music not merely as a means of gratifying individual vanity or uncultivated taste, but as an art capable of indefinite improvement, and in proportion to that improvement ministering to the development, and to the satisfaction when developed, of many of our highest faculties,† shall we not be compelled to

* Generally answering to our ideas of a psalm-tune, but sometimes (as in the choral *O Mensch bewein' dein' Sünde*, in the *Passionsmusik*) extended to whatever contains within itself a choral melody as a foundation on which to build a more varied superstructure. The piece we have instanced appears to us one of the finest specimens of this kind of composition with which we are acquainted.

† The new Science of Mind affords the most satisfactory explanation of the mental phenomena; and by no means the least useful part of this science is the degree of certainty with which we are enabled to discover the comparative utility of the various branches of study to which our attention may be directed. That science or that art (exclusively of material benefits to be derived from it) is more or less useful—that is, conducive to happiness—in proportion to the greater or less number or importance of the faculties it ad-

doubt, nay, utterly to deny, the propriety of giving the name of art to that which concerns itself only with a constituent and, in truth, insignificant portion, and leaves all the rest in comparative neglect? Such, however, is the principle laid down and acted upon, with more or less strictness, in the generality of solo songs. Their harmony is poor in exact proportion to the want of interest in the melodies which compose it, and in them melody is cultivated at the expense of harmony; thus gratifying almost exclusively one only of the faculties which the art has the power of bringing into exercise, namely, the mental faculty which discriminates, and finds pleasure in discriminating, difference of pitch—in other words, the perception of harmony. Now it will be admitted that the composition which affords delight to other powers of the mind, in addition to the one we have mentioned, is entitled to a higher rank than that which pleases this alone. The only question, then, is whether a more complicated style of composition, which should produce this effect, be appropriate to the species of writing whose objects we are now investigating. *A priori*, we should have answered, decidedly it is. Nay more, the only reasons why it so seldom is thus applied are the jealousy entertained by singers of any applause not bestowed on themselves, and the incompetence of the majority of the public to appreciate the higher excellencies of the art. *A posteriori*, we are fully and satisfactorily answered by a reference to Bach's achievements in this style. Bach's solos are, strictly speaking, rather concerted pieces, in which all the parts take an interesting share, not at all interfering with each other, but all contributing to make a complete and homogeneous whole. As in his fugues, so here, the interest continues increasing to the end, each idea flows naturally out of the preceding; the melody given to the voice is never doubled in the accompaniment, and those in the accompaniment cease when they have completed what they have to say, only resuming their functions when they can contribute to the common stock anything really valuable. Hence there are no arbitrary notes appearing on the paper, as if dropped from the clouds, *à propos de rien*, and producing a chasm in the succeeding phrase which the composer is at a loss how to fill up; no abrupt changes of key, re-

dresses. Viewed in this light, music has far higher claims upon our regard than is commonly imagined. It addresses itself directly to many of our highest faculties, and indirectly there are few to which it has not something to say. Had we space, we could go on to shew that the degree of praise to be awarded to particular styles of music may be determined in like manner.

sembling more the shifting scenes of a pantomime than anything for which we can reasonably account ; no turns of melody in any single part which are not in strict accordance with the character of the rest ; no repetition, caused rather by deficiency of ideas in the composer than by any consciousness that it will conduce to the effect of the composition. On the contrary, every note is so exactly in its place—the modulation is so even, so beautiful, like a fair stream gliding through peaceful and flower-besplanged meadows—each single melody sympathises so admirably with its companions, and with the disposition of the whole—the flow of the richest, the most poetical, ideas, is so boundless, so exhaustless—that we cannot but regard these productions as the most beautiful to be found in the entire range of the musical art.

3. *Ihr werdet Weinen und Heulen ;*

4. *Du Hirte Israel! Höre ;*

5. *Herr! gehe nicht in's Gericht ;* are all three on the same plan as the foregoing. Nos. 3 and 5 contain each a chorus of unexampled learning and grandeur, and airs of the highest beauty and ideality. No. 4 might aptly be designated a sacred pastoral ; and as an example of happy mixture of the two styles, as well as from its great beauties as a composition, it is worthy of all admiration.

6. *Gottes Zeit ist die allerbeste Zeit.*—This piece was certainly composed when our author's powers were yet immature. No one at all acquainted with his works can for a moment doubt as to this being one of them ; but yet, amid a great deal of what is good and beautiful, we have here and there an infusion of what is weak, perhaps even commonplace. It is highly important that we thus distinguish between what is wholly worthy of admiration and study, and what is only partially so ; otherwise we lower the standard of excellence, thus losing sight of the true aim of music, considered as a fine art. The piece of which we are speaking would perhaps be more pleasing than those we have just mentioned to uncultivated tastes ; but the propriety of admitting such as judges in the fine arts we utterly deny, asserting, on the contrary, that it is only because the great majority of the public is uncultivated that this principle has ever been admitted and acted upon.

7. *Grosse Passionsmusik* (Messiah), according to the gospel of St. Matthew. This is an oratorio in the primitive sense of the term, being in its form essentially dramatic. It describes the last days of our Saviour on this earth ; and is interspersed with chorals, performing the same office as the chorus in the Greek tragedy. One of these, *O Mensch beweine' dein' Sünde*, is of more worth than

the whole of such an effeminate and whining production as Spohr's *Crucifixion*, which has been so extravagantly bepraised by certain critics, and which has not the merit of novelty to recommend it. The double chorus in E minor, at the beginning of the *Passionsmusik*, is, both in design and execution, the grandest, the most productive of sublime and holy feeling of any we are acquainted with. The choruses throughout the work are all equally fine in their several styles: the *ad lib.* and accompanied recitatives are magnificent, both in expression and modulation; and the airs, possessing all the beauties which we have above attempted to describe, are worthy of equal praise. On the whole, admiring as we do Handel's great work on the same subject, yet regarding it as a work of art, and not as a mere candidate for the majority of suffrages, we should without hesitation assign it a lower rank than the *Messiah* of Bach. When musical education shall be conducted on the plan and to the extent which alone can make the individuals composing the public competent judges, we are confident that our verdict will be confirmed.

The works of this composer for the catholic church which we have seen, consist of three masses in G and A major and B minor, the two former for ordinary occasions, the latter for high mass. All three are very fine works, but the latter displays such consummate learning, such complete mastery of the art, and in the employment of these such inconceivable sublimity and such entire loveliness, that it seems rather the work of a disembodied and exalted spirit, than that of a mere mortal, occupied with the cares, the sorrows, the trials of this transitory state, and subject to the same failings as ourselves. As a work, as a masterpiece of art, it is worthy to stand beside the *Messiah* of the same composer; and any comparison which may be instituted between this and the greatest works of other composers, will only demonstrate the more clearly the immeasurable, the impassable gulph which lies outstretched between them.

We have now finished our too brief examination of these mighty achievements of human genius. It only remains for us to consider what will be their reception at the hands of the present and of succeeding generations. In the present state of general education, a knowledge of musical science is by no means accounted a universally indispensable element. The capability of performing on some instrument, with some power of interpreting the conventional symbols of musical combinations, is all that is required to complete the common idea of a musical education. Now, the one is a purely mechanical accomplishment, the other intellectual in a very slight degree;

both may be acquired without in the least cultivating the taste or imparting vigour to the higher powers of the mind. Further, in the present state of society, it is difficult for the *majority* of the public to obtain even *this* slight modicum of cultivation; and in the present state of society it is, perhaps, impossible for the majority to make that perfect use of their faculties which the Creator in bestowing them evidently willed. As long as things continue thus, man cannot enjoy that degree of happiness of which his mental constitution renders him capable, and to the attainment of which all his efforts are, or ought to be, directed. That things will *always* continue thus, we think too highly of the benevolence and wisdom of the Creator and of the just adaptation of all parts of his creation to each other to believe. We deem it every way possible, that each individual in a highly-civilized community may find not only leisure, but means also, for the due cultivation of the faculties granted to him for his happiness by the Creator: but until this *is* the case, how can we expect a due and universal appreciation of the wonders of Nature or of Art, designed, through the medium of those faculties, to be conducive to the well-being, to the felicity, of the human race? As it is, art is *not* art in its noblest acceptation—namely, when considered as the means of producing the highest gratification to faculties in the highest state of cultivation; but a mere farce, a juggler's trick, at best but the pander to individual vanity or ignorant presumption.

In conclusion, our thorough conviction is, that Sebastian Bach, having shewn in his works what art should be, not what it is, must still wait many a long year for general appreciation, general admiration; but that, when once appreciated, once admired, he will be looked upon as the great pioneer who, disregarding vulgar and temporary applause, singing only for "himself and the muses," cleared the way for the new and glorious career which art has yet to run, under auspices more bright—for aims more noble.

[Since the above was written, we understand that the directors of the Birmingham Festival intend (and before this meets the reader's eye the intention will probably have been fulfilled) to favour the public with one or two specimens of Bach's powers, selected from the *Passionsmusik*, noticed above. Better late than never, say we; but why these eternal selections, why this insane policy of giving one or two bricks as a specimen of the entire edifice? The directors intend to give Mendelsohn's *Paul* entire. Now, we ask, which has the greatest claims to be considered as the greater composer, Mendelsohn or Bach? The answer to this question should decide, in our opinion, the propriety of giving the work of the one in all its completeness, and of the other scattered fragments only.]

ESSAY ON THE RATIONALE OF CIRCUMSTANTIAL EVIDENCE.

No. II.

BY WILLIAM WILLS, Esq.

IN a former Essay on Circumstantial Evidence,* it was stated to be a cardinal rule of jurisprudence to require direct proof of the *corpus delicti*. In the present essay I purpose to investigate the reason and illustrate the propriety of this rule.

Every allegation of legal crime involves the establishment of two separate propositions; namely, that an act has been committed from which legal responsibility arises, and that such act has been committed by a particular individual. Such a complication of difficulties often attends the proof of crime, and so many cases have occurred of conviction of alleged offences which were never committed, that it is a sound rule of legal procedure, derived to us from the Romans, those great lights in all that relates to the principles of jurisprudence, to require express and unequivocal proof of the *corpus delicti* before it is permitted to adduce evidence tending to inculpate any particular person.

If it be objected that rigorous proof of the *corpus delicti* is sometimes unattainable, and that the effect of exacting it must be that crimes will occasionally pass unpunished, it must be admitted that such may possibly be the result. But it is answered that where there is no proof, or, which is the same thing, no sufficient proof, of crime, there can be no legal guilt. Considerations of expediency can never supersede the immutable obligations of justice, and occasional impunity of crime is an evil of far less magnitude than the punishment of the innocent. Such considerations of mistaken policy led the civilians to adopt that cruel and execrable maxim, “in atrocissimis leviores conjecturæ sufficiunt et licet judici jura transgredi;” and when the plea of expediency is once permitted to influence judicial integrity, such is the logical and inevitable consequence. The rule in question is so important in relation to cases of circumstantial evidence, that it will be expedient to illustrate its pertinency and propriety at some length, and, for the sake of simplicity and

* *Ante*, p. 177.

consistency, the exemplifications will be borrowed from cases of alleged murder.

In the application of this rule to cases of homicide, it is essential that there be distinct proof, 1st, of the fact of *death*, and 2nd, of the *specific cause* of death; nor without such proof can any individual be reasonably implicated, or required to explain or account for facts of supposed suspicion. The inspection of the body necessarily affords the best evidence as well of the identity of the deceased as of the fact of death; and a conviction of murder is never allowed to take place unless the body has been found, or there is equivalent proof of the fact of death; and many cases have shewn the peril of a contrary practice. Joan Perry and her two sons were executed, in the year 1660, for the murder of William Harrison, who had suddenly disappeared, but in about two years afterwards re-appeared. The deceased had been out to collect his lady's rents, and had been robbed by highwaymen, who put him on board a ship, which was captured by Turkish pirates, by whom he was sold to a physician near Smyrna.* Sir Matthew Hale mentions a case where A. was long missing, and upon strong presumptions B. was supposed to have murdered him, and to have consumed him to ashes in an oven, that he should not be found. Whereupon B. was indicted of murder, convicted, and executed, and within one year after A. returned, being, indeed, sent beyond sea by B. against his will; "and so," he adds, "though B. justly deserved death, yet he was really not guilty of that offence for which he suffered."† Sir Edward Coke also gives the case of a man who was executed for the murder of his niece, afterwards found to be living. [See also Green's case, *State Trials*, vol. xiv., p. 1311, and Arnott's *Collection of Criminal Trials*].

But to require the production of the body in all cases would be unreasonable, and lead to absurdity and injustice; since the murderer might secure impunity by effectually disposing of his victim's remains, which has often been attempted by burning, but generally without effect, owing to the slow and imperfect combustibility of animal matter. The fact of death may, therefore, be inferred from such strong and unequivocal circumstances of presumption as render it morally certain, and leave no ground for reasonable doubt. Thus, a mariner was indicted for the murder of his captain at sea, and a witness stated that the prisoner had proposed to kill the captain;

* *State Trials*, vol. xiv., p. 1312.

† *Pleas of the Crown*, vol. ii., c. 39.

that, being alarmed in the night by a violent noise, he went upon deck and saw the prisoner throw the captain overboard ; that he was not seen or heard of afterwards, and near the place on the deck where the captain was a billet of wood was found, and the deck and part of the prisoner's dress were stained with blood. It was strenuously argued that, as there were many vessels near the place where the transaction was alleged to have taken place, the probability was that he had been taken up by some of them and was then alive ; but the court, though they admitted the general rule of law, left it to the jury to say, upon the evidence, whether the deceased was not killed before the body was cast into the sea, and the jury being of that opinion, the prisoner was convicted and executed.*

The cases which present the greatest difficulty in establishing the *corpus delicti*, are those of infanticide, poisoning, and suicide. As a consequence of the rule which requires express proof of the *corpus delicti*, that, in cases of alleged infanticide, it must be proved that the child had acquired an independent circulation and existence ; it is not enough that it had breathed in the course of its birth.† If a child has been wholly born and is alive, it is not essential that it should have breathed at the time it was killed ; as many children are born alive and yet do not breathe for some time after birth.‡

Cases of this distressing class generally involve questions purely or principally of medical jurisprudence, and are, therefore, so far not within the province of this Essay.§ The moral circumstances generally adduced as indicative of this crime, may commonly be accounted for by the agency of less malignant motives, and can seldom be unequivocally pronounced to afford a safe presumption of murder. Hard must be the struggle between the opposing motives of shame and affection, before a mother can form the dreadful resolve of taking away the life of her own child. The unhappy subject of these conflicting emotions is commonly the victim of brutality and treachery. Deserted by a heartless seducer and scorned by a merciless world, scarcely any condition of human weakness can be imagined more calculated to excite the compassion of the considerate and the humane.|| The wisdom and the humanity of the legislature, in

* Hindmarsh's case, *Leach's Cases in Crown Law*, vol. ii., p. 571.

† *Rex v. Poulton*; *Carrington and Paine*, vol. v., p. 399—and *Rex v. Enoch*, *ibid.*, 539.

‡ *Rex v. Brain*; *Carrington and Paine*, vol. vi., p. 350.

§ See *The Proofs of Infanticide Considered*, by Dr. Cummin, for a summary of the present state of medico-legal knowledge on that subject.

|| See Dr. William Hunter's tract on *Child Murder*.

accordance with the spirit of the times, has repealed the cruel rule of presumption created in a barbarous age,* and made the endeavour to conceal the birth of a child, by secret burying or otherwise disposing of the body, a substantive offence, instead of treating it as a conclusive presumption of murder.†

In charges of poisoning, the object is to determine whether poison has been administered, and whether it has been the cause of death; since it does not necessarily follow, even where poison has been administered, that death has not resulted from natural causes.‡

The principal grounds upon which the proof of poisoning generally rests, are 1. the symptoms during life; 2. the post mortem appearances; 3. chemical tests; 4. the results of experiments upon animals; and 5. moral circumstances.

The first and second of these heads of evidence involve questions of a medical nature merely: but the diversity of opinion which prevails amongst medical jurists respecting the sufficiency of such evidence alone, and the consideration that the facts must ultimately be submitted to a popular tribunal, acting upon the principles of common observation and experience, render it expedient to notice the general result of those opinions as applicable to this numerous class of cases of circumstantial evidence.

There appears to be no difference of opinion, that the symptoms and post mortem appearances which are usually relied upon as indications of poisoning are such as may in general be produced by other causes. Dr. Christison, while he admits, with every esteemed author on medical jurisprudence, that the symptoms, however exquisitely developed, can never justify an opinion in favour of more than high probability,§ maintains that the doctrine applies only to the *general* characteristics of the symptoms, and that in some cases of *particular* poisons, as, for instance, sulphuric, nitric, and oxalic acids, arsenic, the compounds of mercury,|| and some others, the symptoms only may occasionally afford decisive evidence of poisoning.**

* Stat. 21, Jac. I., c. 27, *ante*, p. 32.

† Stat. 9, G. IV., c. 31., s. 14.

‡ Mary Ann Alcorn's case, Syme's *Justiciary Reports*, vol. I., p. 221; and Charles Munn's case, Inverness Spring Circuit, 1824. Christison, *On Poisons*, pp. 50, 82.

§ Christison, *On Poisons*, p. 39, citing Orfila, Hencke, and Beck; and see, to the same effect, *Outlines of a Course of Lectures on Medical Jurisprudence*, by Dr. Traill, p. 42.

|| Christison, *On Poisons*, pp. 165, 207, 308, 402.

** See the case of Richard Overfield, Shrewsbury Assizes, March 19, 1824,

Dr. Christison conceives that, in many instances, both of acute and chronic poisoning with the strong acids, contrary to the general statements of most systematic writers on medical jurisprudence, distinct evidence may be presented from the morbid appearances only.*

The effect of these several heads of evidence was much discussed in the memorable case of Captain Donellan, who was convicted at the Warwick Spring Assizes, 1781, of the murder of his brother-in-law, Sir Theodosius Boughton. The material facts of this case were as follow :—Sir Theodosius Boughton was a young man of fortune, twenty years of age, and in good health and spirits, with the exception of a trifling ailment, for which he occasionally took a laxative draught. His mother and his brother-in-law, Captain Donellan, and his sister, Mrs. Donellan, lived with him. At the age of twenty-one years Sir Theodosius would have been entitled to a fortune of above £2,000. a year, which, in the event of his dying under that age, would have descended to his sister, Mrs. Donellan. Lady Boughton went into her son's room for the purpose of giving him his draught, and remarked that it smelt like bitter almonds. In about two minutes Sir Theodosius struggled very much, as if to keep the medicine down, and Lady Boughton observed a gurgling in his stomach ; in ten minutes he seemed inclined to doze, but in five minutes afterwards she found him with his eyes fixed upwards, his teeth clenched, and froth running out of his mouth ; and within half an hour after taking the draught he died. Lady Boughton ran down stairs to give orders to a servant to go for the apothecary, who lived at Rugby, a distance of three miles, and in less than five minutes the prisoner came into the bed-room ; and after she had given him an account of the manner in which Sir Theodosius had been taken, he asked where the physic bottle was, and she shewed him the two draughts. Donellan then took up one of the bottles and said " Is this it ?" and being answered " Yes" he poured some water out of the water-bottle, which was just by, into the phial, shook it, and then emptied it out into some dirty water which was in a wash-hand basin. Lady Boughton said, " You should not meddle with the bottle ;" upon which the prisoner snatched up the other bottle, and poured water into it, and shook it, then put his finger to it, and tasted it. Lady Boughton again asked him what he was about, and said he ought not to meddle

for poisoning his own child with sulphuric acid, *Edinburgh Medical and Surgical Journal*, vol. xxii., p. 222.

* Christison, *On Poisons*, 52, 169.

with the bottles ; on which he said he did it to taste it, though he had not tasted the first bottle. The prisoner ordered a servant to take away the basin, the dirty things, and the bottles, and put the bottles into her hands for that purpose, who put them down again on being directed by Lady Boughton to do so. The body was examined ten days after death, but putrefaction was far advanced, and the head was not opened, nor were the bowels examined, and in other respects the examination was incomplete and unskillfully performed ; "so that very little reliance," says Dr. Christison, "can be placed on the evidence from the inspection of the body."* Captain Donellan had a still in his own room, and had used it for distilling roses ; and a few days after Sir Theodosius's death he brought it, full of wet lime, to one of the servants, to be cleaned. It also appeared that Sir Theodosius, shortly before his death, had bought arsenic to poison fish, and some of it was afterwards found locked up in his closet. Captain Donellan appears to have resorted to several disingenuous devices to prevent the post-mortem examination of the body, and to induce Sir William Wheeler, the young man's guardian, to believe that an examination had taken place, when the professional men, having been led by the prisoner to suppose it a case of ordinary sudden death, had declined the examination, on account of the advanced state of putrefaction in which they found it ; there were several other circumstances of suspicion in the prisoner's conduct. Four medical men, three of whom were physicians, were examined on the part of the prosecution, and expressed a very decided opinion—mainly grounded upon the symptoms, the smell of the draught, as observed by Lady Boughton, and the similar effects produced by experiments on animals with laurel-water to the symptoms in the case of Sir Theodosius—that the deceased died of poison, and that the particular poison was laurel-water. The weight of Dr. Rattray's opinion was greatly diminished by the fact that, after he had known all the symptoms, and seen the body opened, he had been as positive that Sir Theodosius died from arsenic as he was at the time of the trial that he had died from laurel-water. When asked "Why may you not be mistaken now ?" he answered, "I cannot conceive that, in these circumstances, any one can be mistaken as to the medicine ; from the sensible qualities described by Lady Boughton I believe it to be of that nature"—the sensible qualities referred to being the resemblance of the smell to that of bitter almonds. Mr. John Hunter was examined on the part of the

* Christison, *On Poisons*, p. 725.

prisoner, and stated a positive opinion that the symptoms did not necessarily lead to the conclusion that the deceased had taken poison, and that the appearances upon dissection explained nothing but putrefaction. This trial has given rise to great diversity of opinion amongst legal and medical men, and the evidence of Mr. Hunter has subjected him to severe animadversion by many of his professional brethren.*

Dr. Christison thus expresses his opinion upon this memorable case :—"The conclusion at which, in my opinion, every sound medical jurist must arrive is, that poisoning in the way supposed was very probable. But I cannot go along with those who think that it was certain ; nor is it possible to see on what grounds such an opinion can be founded, when the general or moral circumstances are excluded."†

This opinion seems to be sound and discriminating. It is clear, from an attentive perusal of the testimony of the professional witnesses, that their opinions were not formed upon symptoms and appearances only, but upon those symptoms and appearances joined with other facts and circumstances. Mr. Hunter was much pressed by the counsel for the prosecution, and by the learned judge, to give an opinion grounded upon those mixed elements ; about which, he justly observed, in one of his answers, every man was as good a judge as he was.

The most decisive and satisfactory evidence of poisoning, is the discovery, by chemical means, of the existence of poison in the body, in the matter ejected from the stomach, or in the food or drink of which the sufferer has partaken. Dr. Christison dissents from the opinion expressed by all German and most French authors in medical jurisprudence, that "poisoning can never be completely substantiated unless the particular poison be found out."‡ That broad doctrine has certainly never been adopted in English jurisprudence ;§ and its adoption would be fraught with danger. Some of the vegetable poisons, at least in the present state of chemical science, scarcely admit of that kind of proof ;|| and to require it would be to proclaim impunity to offenders skilled in medical chemistry. A case of conviction occurred in Scotland, where a servant girl had put some

* Beck's *Elements of Medical Jurisprudence*, 901 ; Christison, *On Poisons*, p. 725 ; *The Theory of Presumptive Proof*.

† Christison, *On Poisons*, p. 724.

‡ Christison, *On Poisons*, Preface, p. 14.

§ *Rex v. Donellan, ut supra* ; and *Rex v. Angus, infra*.

|| Christison, *On Poisons*.

poisonous matter into gravy. Dr. Christison was of opinion that all the symptoms might have been produced by natural means ; and was led to suppose that poison had been swallowed merely from the circumstance of two persons being taken ill nearly at the same time, after partaking of the same food, and with symptoms which various kinds of poisons would produce. In answer to questions by the court, he said the probability was greatly strengthened by the fact that the violence of the symptoms was in proportion to the quantities of the suspected food taken.* The prisoner admitted that she had introduced a little powder, but declared that it was only for a bit of fun, and not to do harm, but merely to sicken the parties. This question was the subject of much discussion in the celebrated case of Castaing. But, upon general principles, it cannot be doubted that courts of law would require chemical evidence of the poisoning to be adduced wherever it were attainable ; and it is believed that no modern case of satisfactory conviction can be adduced where there has not been such evidence or, in its absence, the equivalent evidence of confession. The following remarkable case is highly instructive in relation to this important question.

Robert Sawle Donnall, a surgeon and apothecary, of Falmouth, was tried at the spring assizes, 1817, at Launceston, before Mr. Justice Abbott, for the murder of Mrs. Elizabeth Downing, his mother-in-law. The prisoner and the deceased were next-door neighbours, and lived upon friendly terms ; and there was no suggestion of malice, nor could any motive be assigned which could have induced the prisoner to commit such an act, except that he was in somewhat straightened circumstances, and in the event of his mother-in-law's death would have become entitled to a share of her property. On the 19th of October the deceased drank tea at the prisoner's house, and returned home much indisposed, retching and vomiting, with a violent cramp in her legs, from which she did not recover for several days. On Sunday, the 3rd of November, after returning from church, she dined at home on boiled rabbits smothered with onions, and, upon the invitation of her daughter, drank tea in the evening at the prisoner's house, with a family party. The prisoner handed to the deceased cocoa and bread and butter ; and while she was drinking the second cup she complained of sickness and went home, where she was seized with retching and vomiting, attended with frequent cramps, and then a violent purging took place, and at eight o'clock the next morning she died. The nervous

* *Rex v. Mary Ann Alcorn*, Syme's *Justiciary Reports*, vol. i., p. 221.

coat of the stomach was found to be partially inflamed or stellated in several places, and the villous coat was softened by the action of some corrosive substance; the blood-vessels of the stomach were turgid, and the intestines, particularly near the stomach, inflamed. The contents of the stomach were placed in a jug in a room to which the prisoner—to whom, at that time, no suspicion attached—had access, and it appeared that he had clandestinely tampered with those contents by throwing them into another vessel containing a quantity of water; and there were other suspicious moral circumstances in his conduct which are purposely omitted in this analysis, as the case turned entirely upon the question of the sufficiency of the proof of the *corpus delicti*. Dr. Edwards concluded from the symptoms—the shortness of the illness and the morbid appearances—that the deceased had died from some active poison; and, in order to discover the particular poison supposed to have been used, he applied to the contents of the stomach the chemical tests of the sulphate of copper in solution, and the ammoniaco-nitrate of silver, which severally yielded the characteristic appearances of arsenic: the sulphate of copper producing a green precipitate, whereas a blue precipitate is formed if no arsenic be present; and the nitrate of silver producing a yellow precipitate, instead of a white precipitate, if arsenic be not present. Dr. Edwards considered these tests infallible, and used them, as he stated, because they would detect a more minute portion of arsenic; on which account he considered it to be more proper for the occasion, as, from the appearance of the tests, he found there could not be much. Dr. Edwards also tried experiments upon the bile mixed with water and with a decoction of onions, to ascertain whether any substances taken into the stomach would alter the appearances produced by those tests, but they produced no appearance of arsenic. The great object of the prisoner's counsel was to extract from Dr. Edwards, upon his cross examination, admissions, 1st. That the symptoms and appearances were such as might have been occasioned by some other cause than poisoning; 2nd. That the reduction test would have been infallible; and 3rd. That it might have been adopted in the first instance, and might also have been tried upon the matter which had been used for the other experiments. Upon his re-examination, Dr. Edwards accounted for his omission of the reduction test by stating that the quantity of matter left after the other experiments would have been too small, and that it would not have been so correct to use the matter which had been subjected to the experiments.—The prisoner's counsel, having obtained this admission, proceeded

to neutralize and explain away the circumstances of presumption against the prisoner, by shewing, first, that the symptoms and morbid appearances, though they were such as might and did commonly denote poisoning, did not exclude the supposition that they might also have been occasioned by cholera morbus, or some other cause ; secondly, that no valid reason existed why, if arsenic had been contained in the contents of the stomach, it had not been reproduced in the metallic state, either by an original experiment, or by experiments on the matter to which the other tests had been applied ; thirdly, that the dilution of the contents of the stomach had not rendered the experiment of reduction impracticable, but only more dilatory and troublesome ; and, fourthly, that the tests actually resorted to were fallacious, and produced the same appearances upon application to innocent matter, namely, the sulphate of copper producing the green, and the nitrate of silver producing the yellow precipitate, on being applied to an infusion of onions. It was in vain to urge that a decoction of onions was not the same thing as that particular preparation of onions of which the deceased had partaken, and that, in the hands of the witness for the prosecution, this experiment had been attended with a different result ; the facts adduced by the prisoner's witnesses conclusively proved that the appearances produced by the tests employed might be produced by some other cause than the presence of arsenic, and therefore that the tests were fallacious, and that an infallible test might have been resorted to. Thus every one of the grounds of presumption against the prisoner were successively destroyed, so that the case was left without any substantial foundation ; though the conduct of the prisoner had naturally created, and must necessarily leave, strong and well-founded impressions unfavourable to the belief of his innocence.

The chemical evidence brought forward in the case of Mary Ann Burdock, who was convicted at the Bristol Spring Assizes, 1835, of the murder of Mrs. Clara Ann Smith by poison, presents an instructive contrast with that adduced in the last-mentioned case : the moral evidence was also strong. The deceased, a widow, about sixty years of age, was possessed of considerable property in money, and had for several years lived in lodgings at various places, and ultimately went to lodge with the prisoner, who kept a lodging-house in Bristol. In October, 1833, the deceased became indisposed from a cold ; and in the evening of the 26th of that month the prisoner gave her some gruel, into which she had been observed, by a young woman hired to wait on the deceased, to put some pinches of yellow powder,

which she stated to be to relieve her from pain, after which she twice washed her hands. The servant remarked to the prisoner upon this, as an unusual mode of administering a powder. The prisoner cautioned the servant not to take of any thing out of vessels used by the deceased, falsely representing her to be dirty in her habits; and cautioned her not to tell the deceased that she had put anything into the gruel, representing that if she knew there was anything in it she would not take it. The prisoner carried away what was left of the gruel; and in a few minutes after the deceased had partaken of it she complained of being poorly, and in half an hour became ill; vomiting, purging, and violent pain ensued, and in about two hours she expired. The prisoner had employed a man, about six days before this event, to purchase arsenic in order to poison rats, a pretext which was proved to be groundless. The deceased was buried on the 28th of October, but her friends did not hear of her death until many months afterwards. From the change which took place in the prisoner's habits and mode of living after Mrs. Smith's disease, from her denial that the deceased had left any property, and from some other circumstances, suspicion was excited, and the corpse was disinterred and examined on the 24th of December, 1834, and found to be in a remarkable state of preservation. Without detailing all the appearances, it is sufficient to observe that the mucous membrane of the stomach and duodenum was smeared very thickly with a large quantity of a yellow substance, which penetrated in patches the coats of the stomach and intestines; and where the spots had so penetrated, the inside of the intestinal canal was stained to a much greater extent than the outside; so that it must have penetrated from the interior to the exterior, as would be the effect of the matter having been taken into the stomach. Mr. Herapath, the lecturer on chemistry and chemical toxicology at the Bristol Medical School, submitted the yellow powder found in the stomach to various experiments. Having dried it, he ground some of it up with carbonate of soda and charcoal, and introduced it into a reducing tube, and immediately formed a volatile metallic body, which was metallic arsenic; he then oxidized the metallic arsenic, and it sublimed into a white volatile oxide, which was characteristic of arsenious acid; he then made a solution of the oxide by infusing two drops of water, and added a small portion of ammoniacal nitrate of silver, when there was formed the characteristic yellow precipitate. He put into another portion a minute quantity of ammoniacal sulphate of copper, which immediately produced the green precipitate of Scheele; and, finally, he reduced a larger quanti-

ty, and passed through it a stream of sulphuretted hydrogen gas, and reproduced the original orpiment, or sulphuret of arsenic: these various experiments were repeated five or six times, and uniformly with the same results. Mr. Herapath then washed the stomach in water, allowed the substance to precipitate, dried and weighed it, and found it to contain seventeen grains; he then destroyed the animal matter, dissolved the arsenic, turned the sulphur into sulphuric acid, and precipitated the whole by sulphuretted hydrogen gas, and that reproduced sulphuret of arsenic. From thirteen grains of the mixed matter he obtained four grains of sulphuret of arsenic: there were still some portions adherent to the stomach, which he could not wash off, and it must be remembered that some had been evacuated by vomiting. This case is one of the most satisfactory on record.

Sometimes, even with all the aids of science, it is impossible to arrive at a safe and unquestionable conclusion in cases of this kind. A young man, named Freeman, a druggist's apprentice, was tried at the Leicester spring assizes, 1829, before Lord Chief Justice Best, for the murder of Judith Buswell, his master's female servant, by Prussic acid. The deceased was pregnant by the prisoner, and was found one morning dead in bed. Several circumstances led to the suspicion that the apprentice had been instrumental in the administration of the poison; but it was proved that the deceased had made arrangements for a miscarriage by artificial means on the very night in question; and it was therefore represented, on the part of the prisoner, that she had taken the poison of her own accord. It appeared that she had taken Prussic acid from a partially emptied phial, which lay corked and wrapped in paper beside her bed, where she was found lying with the bed-clothes drawn up to her chin and her arms folded across the trunk; a piece of leather and string, which appeared to have been taken from a bottle, were found in the room. It was considered in the highest degree improbable, but was generally admitted by the medical witnesses to have been *possible*, that the deceased might have corked the bottle after taking the dose from which she died, and the prisoner, though his conduct had very deservedly drawn suspicion upon him, was therefore acquitted. The fact is instructive and admonitory, that Professor Christison, in the subsequent edition of his book, *On Poisons*, with the candour which ever marks the scientific mind, acknowledges that the concurrence which he had previously expressed in the opinion of the majority of the witnesses, that there could not be time, after swallowing the

poison, for the performance of the acts of volition implied in the supposition of suicide, was given rather too unreservedly; and he mentions a lately published case of suicide, in which an apothecary's assistant was found dead in bed, with an empty two-ounce phial on each side of the bed, the mattress, which is used in Germany instead of blankets, pulled up as high as the breast, the right arm extended straight down beneath the mattress, and the left arm bent at the elbow.*

On the trial of Charles Angus, at Lancaster, in 1808, for the murder of Miss Burns, there was abundant evidence of suspicious conduct to fix the prisoner as the criminal, had there been clear proof of the *corpus delicti*. The cause of death was an aperture in the stomach, alleged to have been caused by the action of poison; but it was considered possible that it might have been a case of spontaneous perforation after death, from natural causes, and there was no evidence that poison had been administered. One of the medical witnesses caused great offence by his testimony in favour of the accused, which gave rise to much angry controversy; but the appearances have since been declared, by the high authority of Professor Christison, to be incompatible with the effects of a strong corrosive poison, unless death had occurred very soon after it was swallowed, which was out of the question.†

It of necessity happens that circumstances of suspicion in the conduct of the accused are frequently blended with the scientific testimony; but it is apprehended that conviction cannot be considered satisfactory, unless the crime be established by adequate evidence, independently of the moral circumstances. The peculiar office of evidence of moral circumstances appears to be, the discrimination of the guilty individual, rather than to supply deficiency of substantive and independent evidence as to the existence of the *corpus delicti*. Dr. Christison urges that "there may be sufficient evidence in the symptoms and morbid appearances without any chemical facts to render poisoning so highly probable, that, in conjunction with strong moral circumstances, no sensible man can entertain any doubt on the subject." Mr. Justice Abbot, in his charge to the jury upon Donnall's case, in reference to this question, said, "if the evidence as to the opinions of these learned persons who have been examined on both

* *Rex v. Freeman*—Christison, *On Poisons*, p. 705; *London Medical and Surgical Journal*, vol. viii., pp. 527, 750; and Beck's *Medical Jurisprudence*, p. 888.

† Christison, *On Poisons*, p. 133; and the printed report of the trial.

sides, should lead you to *doubt* whether you should attribute the death of the deceased to arsenic having been administered to her, or to the disease called cholera morbus, then, as to this question, as well as to the other question, the conduct of the prisoner is most material to be taken into consideration ; for he, being a medical man, could not be ignorant of many things as to which ignorance might be shewn in other persons : he could hardly be ignorant of the proper mode of treating cholera morbus, he could not be ignorant that an early burial was not necessary ; and when an operation was to be performed in order to discover the cause of death, he should not have shewn a backwardness to acquiesce in it ; and when it was performing, and he attending, he could not surely be ignorant that it was most material for the purposes of that investigation that the contents of the stomach should be preserved for minute examination.* It is manifest that the learned judge intended these remarks to apply only to cases circumstanced as the case before him was ; for thus to conjoin the moral circumstances with the medical facts, as an element of proof of the poisoning in cases not so circumstanced, appears to be open to objection, since the hypothesis of poisoning is resorted to in order to account for the moral circumstances as well as for the morbid appearances, while the moral circumstances are appealed to as corroborative of the evidence of poisoning.

Suicide and accident are sometimes artfully suggested and plausibly urged as the causes of death, where the allegation cannot receive direct contradiction ; and in such cases the truth can be ascertained only by comparison of all the attendant circumstances, some of which, if the defence be false, are commonly found to be irreconcilable with the cause assigned. Although these cases are generally connected with questions of medical jurisprudence, the scientific facts must nevertheless be submitted to the test of experience and common observation, as applied by the mass of mankind in many other cases not less difficult of determination. Such cases, therefore, in their more general aspects and bearings, belong to general jurisprudence, and supply important illustrations of general legal doctrines ; and they, moreover, shew the manner in which such defences are frequently repelled by their manifest incompatibility with the general circumstances.

William Corder was tried at the Bury St. Edmunds Summer Assizes, 1828, for the murder of Maria Marten. The deceased had

* Report of the trial, *ut supra*.

borne a child to the prisoner; and was taken by him from her father's house, under the pretence of taking her to Ipswich to be married. The prisoner having represented that the parish officers meant to apprehend the deceased, she left the house, on the 18th of May, in disguise, a bag containing her own clothes having been taken by the prisoner to a barn belonging to his mother, where it was agreed that she should change her dress. The deceased was never heard of afterwards; and the various and contradictory accounts given of her by the prisoner having excited suspicions, which were confirmed by other circumstances, it was ultimately determined to search the barn, where, on the 19th of April, a distance of nearly twelve months, the body of a female was found, which was clearly identified as that of the deceased. A handkerchief was drawn tight round the neck; a wound from a pistol ball was traced through the left cheek, passing out at the right orbit; and three other wounds were found (one of which had entered the heart) made by a sharp instrument. The prisoner, who, in the interval, had removed from the neighbourhood, upon his apprehension denied all knowledge of the deceased; but in his defence he admitted the identity of the remains, and alleged that an altercation had taken place between them at the barn, in consequence of which, and of the violence of temper exhibited by the deceased, he expressed to her his determination not to marry her, and left the barn; but that immediately afterwards he heard the report of a pistol, and, going back, found the deceased on the ground, apparently dead; and that, alarmed by the situation in which he found himself, he formed the determination of burying the corpse and accounting for her absence as well as he could. But the variety of the means and instruments employed to produce death, some of them unusual with females, were considered important in connection with the contradictory statements made by the prisoner to account for the absence of the deceased and the general moral circumstances, to discredit the account ultimately set up by him. He afterwards made a full confession, and was executed pursuant to his sentence.*

At the Durham autumn assizes for 1824, Mr. Hodgson, a surgeon, was tried for attempting to poison his wife. It was proved that pills containing corrosive sublimate, and compounded by the prisoner, were given by him to her in place of pills of calomel and opium, which had been ordered by her physicians. But it was alleged by him that, being at the time intoxicated, he had mistaken for the shop bottle

* Printed report of the trial.

containing opium the corrosive sublimate bottle, which stood next it. This was certainly an improbable error, considering that opium was in powder, and the sublimate in chrystals. But it was not the only one which he alleged that he had committed. Not long after his wife took ill, the physician sent the prisoner to the shop to prepare for her a laudánum draught, with water for the menstruum. When the prisoner returned with it, the physician, in consequence of observing it to be muddy, was led to taste it, before he gave it to the sick lady, and, finding it had the taste of corrosive sublimate, he preserved and analyzed it, and discovered that it did contain that poison. The prisoner stated in defence, that he had a second time committed a mistake, and, instead of water, had accidentally used for the menstruum a corrosive sublimate injection, which he had previously prepared for another patient: but this was proved to have been impossible, since the injection contained only five grains to the ounce, while the draught, which did not exceed one ounce, contained fourteen grains.*

James Greenacre was tried before the Central Criminal Court, at the Old Bailey, on the 10th of April, 1837, for the murder of Hannah Brown. The prisoner and the deceased were to have been married; in the prospect of which event the deceased had converted nearly all her goods into money. On the morning of the 24th of December the deceased left her home, stating to a neighbour that she was going to the house of her intended husband at Camberwell, but should return in the evening. On the 28th of December the trunk of a female was found in the Edgeware Road, without its head or legs; on the 6th of January a female head was found in the Regent's Canal; and on the 2nd of February the legs of a female were found in an ozier-bed, at Camberwell: these several parts were clearly ascertained to belong to the same body, and were identified as the remains of the deceased. Upon his apprehension the prisoner at first denied all knowledge of the deceased; but he subsequently admitted that, on the evening of the day on which the deceased left her home, she came to his house, and he stated that they had had an altercation, in consequence of her duplicity in the statement of her property; and that, during this conversation, the deceased was moving backwards and forwards in her chair, which was on the balance; that he put his foot to the chair, and she fell back, with great violence, against a block of wood; and that, finding life extinct, he made up his mind,

* *Edinburgh Medical and Surgical Journal*, xxii., p. 438; and Christison, *On Poisons*, p. 81.

in the alarm of the moment, to conceal her death and get rid of her remains, in order to which he had divided them in the manner stated. This ingenious fabrication was clearly refuted by the professional witnesses, who proved that a wound in the eye, which had occasioned the escape of the humours, and around which there was an ecchymosis, must have been inflicted during life, and deprived the deceased of sense for a time, and that it could not have been occasioned by a blow at the back of the head; also that, from the retracted state of the muscles of the neck, and the emptied condition of the blood-vessels, the throat must have been cut either before or immediately after death.

The length to which this paper has extended renders it necessary to postpone the expression of some interesting reflections which spring from the subject; but we may remark in general, that the rule which has been dilated upon is one of evident wisdom and utility, and that the rigorous application of it is essential to well-founded confidence in the truth and correctness of judicial determinations grounded upon circumstantial evidence.

SKETCHES OF EUROPEAN ORNITHOLOGY.

GOULD'S "BIRDS OF EUROPE."

PARTS IX. AND X.

PART IX.—The first plate contains a very pretty and spirited representation of the Common Scops, *Scops Aldrovandi*,—*Scops petit-duc*, *Fr.*,—*Kleine Ohreule*, *G.** This species has a very wide geographic range, being found in Europe, Asia, and Africa. Mr. Gould has received specimens from China. It is common in the south of Europe, but very rare in the north and in England. "In

* As regards the French, German, and Italian names, we prefer taking them from other authors, as we find them, to altering them according to our own views. They require, however, much revision: we believe such a reform has been effected in Mr. C. T. Wood's *Ornithological Guide*; but we have not at present a copy of that work at hand.—Eds.

Europe it appears to be strictly migratory, arriving late in spring, when moths and the larger Coleopterous insects, upon which it principally subsists, abound; but in the hotter portions of the Old World, where such insects are always abundant, numbers of these birds are stationary throughout the year: to these, its most common food, are added birds, mice, and other small animals. In its manners it is principally nocturnal, issuing forth from its hiding place on the approach of twilight, in chase of those insects which are also roused from their state of repose at the same time.—It breeds in holes of decayed trees, clefts of rocks, and old buildings, the eggs being four or five in number, of a pure white.—The sexes resemble each other. Our author has, of course, represented this bird of the natural size.

A male and female, rather less than the natural size, and beautifully executed, of the Common Teal, *Querquedula crecca*,—*Petite Sarcelle*, *Fr.*,—*Anatra querquedula*, *It.*,—*Kriek Ente*, *G.* Widely distributed over the Old World, but not found in America, the bird which occurs in that country, and which has been mistaken for the present species, being distinct. Breeds in the north of Britain, but great flocks visit us every winter.—Selby asserts that the broods hatched in Britain never leave us, and we have no doubt whatever of the accuracy of the statement. "The Teal breeds," according to that author, "in the long rushy herbage about the edges of lakes, or in the boggy parts of the upland moors. Its nest is formed of a large mass of decayed vegetable matter, with a lining of down and feathers, upon which the eggs rest;" these "are eight or ten in number, and of a yellowish white."

The Middle Woodpecker, *Picus medius*,—*Pic mar*, *Fr.*,—*Picchio sarto*, *It.*,—*Weisbunt Specht*, *G.* The plate represents a male and female of the natural size; they would have been better had the attitudes been less constrained—a very common fault with ornithological painters, but one from which Mr. Gould generally steers clear. Common in Europe, especially the southern districts. It feeds, like its congeners, on insects procured in the usual manner of the Woodpeckers, but also, according to the author of the work before us, on "various fruits and berries." The eggs are of a glossy white, and laid in the holes of trees. This species is remarkable for the similarity of the sexes, which can only be determined with certainty by dissection.

The Common Jay, *Garrulus glandarius*,—*Geai*, *Fr.*,—*Chian-daia*, *It.*,—*Eichel Krahe*, *G.* The figure, natural size, is in many respects very good; but it wants that indescribable pertness of expres-

sion so remarkable in the Jay in its natural haunts. This beautiful and well-known bird is common in the temperate portions of Europe.

Common Ossifrage, *Ossifraga albicilla*,—Aigle pygargue, *Fr.*—Fisch Adler, *G.* Excellent figures of an adult and a young bird of the first year, one third of the natural size. "It is the most common of the European Eagles, and perhaps the most widely dispersed. In the British Islands it frequently occurs along the rocky shores of England, Wales, Ireland, Scotland, and the adjacent islands, and many pairs are known annually to breed in different parts of the three last-named countries." Its range over Europe is extensive, but it is most abundant in the northern districts, chiefly resorting to the sea-shore and to the margins of rivers and lakes, in pursuit of fish. It also feeds on hares, lambs, fawns, &c., and even carrion. Builds mostly on rocks, but sometimes on the tops of lofty trees. It lays two white eggs. The sexes are similar, but the young do not attain the mature plumage—characterized by the white on the tail, and the yellow colour of the bill—till three or four years old.

A male, natural size, of that pretty little bird the Crested Tit, *Parus cristatus*,—Mésange huppée, *Fr.*—Hauben Meise, *G.* Sir W. Jardine assures us that this bird regularly breeds near Glasgow; and although it is unquestionably a very rare bird in Britain, yet nothing is commoner than to meet with specimens said to be British, but which are for the most part imported from the continent, in many parts of which it abounds. "In habits it resembles the rest of the smaller Tits, feeding on insects, berries, and the seeds of evergreens."—M. Temminck says it builds in the holes of walls or trees, or in the abandoned dreys of Squirrels and Pies. The eggs are as many as ten in number, of a white colour, marked on the larger end with spots of blood red. The sexes offer no difference in plumage.

Dusky Sandpiper, *Totanus fuscus*,—Chevalier arlequin, *Fr.* The plate represents two individuals, one in summer plumage, the other assuming its winter dress. The figures are good, but we do not find in them quite so much of the graceful form Mr. Gould speaks of in his description. Abounds in many parts of Europe and Asia, breeding in the northern portions of the former. Resorts to the borders of lakes and morasses, and feeds on fresh-water mollusca, insects, and worms. Nidification unascertained. The sexes are similar in plumage, but the female is somewhat superior in size, and the young birds are distinguished by the numerous white spots on the back.

Wood Shrike, *Lanius rufus*—Piegriche rousse, *Fr.*—Velia col-

capo-rosso, *It.*—Rothköpfiger Vurger, *G.* Very accurate figures of the male and female, natural size, but they might have been more spirited. Abundant on the continent, especially the warmer portions, but only a straggler in Britain. In habits, observes Mr. Gould, it resembles the Redbacked Shrike, but it differs from its congeners in the close resemblance of the sexes, which are only distinguishable by the brighter hues of the male. Feeds on coleopterous and other large insects, and also on young and weak birds. Builds in the forked branch of a bush, and lays five or six whitish-green eggs, irregularly blotched with grey.

Spotted Nutcracker, *Nucifraga caryocatactes*—Cassenoix, *Fr.*—Ghiandaia nucifraga, *It.*—Nussrabe (Nut Raven!), *G.* Found almost throughout Europe, being migratory in the northern districts; a rare straggler with us. Its habits and food bear a strong resemblance to those of the Woodpeckers, and, like them, it ascends the trunks of trees in search of insects. It also subsists on nuts and berries. Builds in the holes of trees, enlarging the cavity if necessary, and lays five or six yellowish-white eggs. The male is somewhat larger than the female, and, Mr. Gould thinks, of a slightly brighter hue. The figure, natural size, is as good as we can desire.

Crested Grebe, *Podiceps cristatus*—Grèbe huppé, *Fr.*—Cólímbo cristato, *It.*—Gehaubter Steissfuss, *G.* We have no hesitation in pronouncing this decidedly the best of Mr. Gould's plates we have hitherto criticized. The adult especially is perfect in every respect, and is truly a model of ornithological painting. Inhabits Britain and the temperate regions of Europe generally, and also parts of Asia and Africa, frequenting lakes and rivers, and occasionally resorting to the sea-coast. The nest is formed of a mass of aquatic herbage, on the margin of the water, with the variations of which it rises or falls. Lays three or four greenish-white eggs, stained with brown. The young birds and the adults in winter plumage have been described as the Tippet Grebe. Mr. Gould alludes to the circumstance of feathers being frequently found in the gizzard of this bird. Audubon speaks of a feathery substance occurring in the gizzard of an American species, and states that it consists of vegetable matter eaten by the bird. Some time since we expressed an opinion that the matter found in the Crested Grebe might be accounted for in a similar manner: but the examination of a quantity taken from the stomach of that species, and sent to us by an Irish gentleman, convinced us that they are really feathers from the breast of the bird. This being the case, the circumstance is not easily accounted for. True, a few

might be swallowed during the process of preening the feathers, but not to the amount in which they appear to be commonly met with. Besides, why should that be the case with the Grebes alone, and especially in the Crested species? But we must pass on.

On the next plate are figured a male and female, size of life, of that beautiful little bird the Dartford Whinling, *Melospilus provincialis*—Becfin pittehou, *Fr.* This species is very local in its distribution, being only found in the warmer parts of Britain and Europe. In this country it is chiefly met with near London, frequenting furze commons, where it breeds. The nest consists of dry grass and vegetable fibres, intermingled with wool. The eggs resemble those of the Whitethroated Fauvet. The plumage of the female is more dusky than that of the male. Our author's representations are very faithful. Montagu's description of this species is remarkably interesting, and is, we doubt not, familiar to our readers.

Baillon's Crake, *Crex Baillonii*—Poule-d'eau Baillon, *Fr.* An adult and a young bird are figured; the attitudes are not unexceptionable, but the representations are otherwise excellent. Inhabits the southern and south-eastern districts of Europe, and has occasionally been taken in England, though its occurrence in this country was unknown before the time of Montagu, the indefatigable author of the *Ornithological Dictionary*, a work which will always be valuable in the eyes of the ornithologist. This pretty little bird frequents the margins of lakes, rivers, and marshes, especially where vegetation is luxuriant. Here it sedulously hides itself from observation, and can rarely be induced to take wing. "It is said to be able to swim and dive very readily, and makes its nest near the water's edge, in which it deposits seven or eight eggs, not unlike a large olive in form, size, and ground-colour, but spotted with darker greenish-brown." Feeds on worms, slugs, insects, seeds of plants, &c. "A specimen in the collection of the Rev. Dr. Thackeray, Provost of King's College, Cambridge, was taken, during a cold and frosty January, on some ice near Melbourn, about nine miles south of Cambridge. To this spot, originally fen land, the poor bird had resorted, in an inclement season, to obtain a meal, but, having wandered far from its native and more congenial latitude, was so exhausted by want of food or the low temperature of the season, or the combined effects of both, as to allow itself to be taken alive by the hand." The sexes scarcely differ at all, but the young birds want the blue-gray colour on the under parts characteristic of maturity.

Scarlet Trascel, *Erythropsiza erythrina*—Bouvreuril Pallas, *Fr.*

Lovely figures of the male and female, the latter being distinguished by the entire absence of the bright scarlet tints of the male. The Scarlet Trascel has been confounded occasionally with Wilson's *Fringilla purpurea*, an entirely distinct species. It appears to be very rare in many parts of Europe, and our author is in possession of some of the few specimens existing in British collections. It is, however, common in Russia. It frequents gardens, and its habits are supposed to resemble those of our Hedge Coalhood, *Pyrrhula vulgaris*. The young birds, as well as the female, have no scarlet on the head and rump; and we think, with Mr. Gould, that the male casts off its brilliant attire in winter,

Common Buzzard, *Buteo vulgaris*—Buse, *Fr.*—Mause Falk, *G.* We are very well pleased with the plate, representing an adult, two-thirds of the size of life. The sluggish and timid nature of this species is pretty generally known. Feeds on small mammalia and reptiles, and even, when pressed by hunger, on dead or putrid animal matter. Inhabits Britain and the temperate parts of Europe, especially the well-wooded districts. "The nest is constructed of sticks in the densest part of the wood, and it sometimes takes up with the deserted nests of Crows, Pies, &c. The eggs are two or three in number, of a dirty white colour, slightly spotted with reddish-brown." Mr. Gould informs us, from his own experience, that "the birds of one year old are much lighter in their plumage than those of the succeeding year," and that they become darker each year until maturity, when the colouring is considerably more uniform.

Subalpine Fauvet, *Ficedula leucopogon*—Becfin subalpin, *Fr.*—We believe it will be found necessary to remove this species from the genus *Ficedula*; probably it will stand intermediate between that group and *Melospiza*. The figures on the plate, of both sexes, summer plumage, are very fair. The male is distinguished by the reddish-chestnut colour on the throat and breast: the young differ but little from the female. The Subalpine Fauvet never occurs in England: "the natural habitat is limited to the south of Europe, especially Italy and Sardinia; it is also known to exist in considerable abundance on the banks of the Nile, as far as Abyssinia. It frequents bushes and underwood, living upon insects, small caterpillars, &c. Of its eggs and nidification nothing is known.

An adult male in the spring plumage, and a young bird of the year, three-fourths of the natural size, of the Common Cormorant, *Cormoranus carbo*—Grand Cormorant, *Fr.*—Marangone aquatico, *It.*—Schwarze Kormoran, *G.* The plate is "not bad," but scarcely

so excellent as many of the preceding. Common on the rocky and reedy shores of Britain and the rest of Europe. "They occasionally perch and roost on trees, towers, and rocky projections; and although the summits and ledges of rocks overhanging the sea are the principal and favourite breeding stations, still it is known to incubate occasionally in trees, and even upon the ground, as is the case in the Farn Islands, and the extensive reed beds in Holland. The nest is composed of dried sea-weed rudely put together, and often of a considerable thickness; the eggs, generally three in number, are greenish-white, covered with a chalky coating, and extremely small compared with the size of the bird. In swimming, the body of the Cormorant is nearly all immersed below the surface of the water, the tail serving as a very effectual rudder, by means of which it is able either to dive or turn in the most rapid and dexterous manner." Its food consists of fish, of which it destroys immense numbers, chasing them under the water; the dilatibility of the throat enables it to swallow with safety fishes of comparatively large bulk. The young have the whole of the under parts dusky white, and want the plumes on the head of the adults.

The Orpheus Fauvet, *Ficedula orphea*—Becfin orphée, *Fr.*—The bill, and, indeed, the whole body of this bird are of a stouter make than those of the more typical members of the genus; and, with due deference to the opinion of Mr. Gould, we should be inclined to remove the species from *Ficedula*. Common in the south of Europe, and sometimes found in Switzerland, but never further north. Specimens have been received from India. According to Professor Savi, its habits resemble those of the common White-throated Fauvet of Britain. Feeds on insects and berries, and builds in bushes, often in company with others of the same species; also, according to Temminck, in the holes of old walls, or under the eaves of deserted and isolated buildings. Lays four or five eggs, nearly white, irregularly marked with yellowish blotches and small brown spots. The female is distinguished by the head being of the same colour as the rest of the plumage. These birds are not remarkable for beauty, either as regards shape or plumage, but they are well figured in the plate.

Ring Ouzel, *Merula torquata*,—Merle à-plastron, *Fr.*,—Merla torquata, *It.*,—Ring Drossel, *G.* Our author's figures, of a male and female, size of life, are beautiful, and so is his description, which we shall present entire:—"The periodical visits of this bird to our coast," says Mr. Selby, "are contrary to the others of the genus that

migrate, viz., the Fieldfare, Redwing, and Common Thrushes, as it arrives in spring, and immediately resorts to the mountainous districts of England and Scotland, preferring those that are the most stony and barren.' Although it doubtless always breeds in the situations above described, it may not unfrequently be seen traversing the hedgerows of uncultivated lands during its passage to and from distant climates.—In general form and appearance it strictly resembles the Blackbird (Garden Ouzel), but in its manners it is much more shy and distrustful, rarely permitting itself to be approached. Unlike that bird, it is not observed skulking among the bushes, &c., but affects more open situations, which doubtless renders it habitually cautious, as being more necessary to its safety. Its voice is somewhat harsh and powerful, consisting of a few notes, which, according to Mr. Selby, are not unlike those of the Missel Thrush. On the continent it is distributed through most of the northern countries, and is very common in Sweden, France, and Germany; indeed, with the exception of Holland, it is universally distributed throughout Europe, as well as the adjacent parts of Asia and Africa. In all these countries it is said to be migratory; and we may easily conceive the cause of this to be a failure of a supply of food in the peculiar situations it frequents, and the consequent necessity of retiring to a more genial climate, where berries, fruits, and insects may be easily obtained.—The male differs from the female in the greater purity and contrast of his colours. The general plumage is black, each feather having a margin of grey; a broad gorget of pure white extends across the chest; the bill is blackish brown at the tip and yellow at the base; legs blackish. The plumage of the female is more clouded with brownish-grey, the pectoral gorget being less extensive, and tinged with dusky brown. The young males closely resemble the adult female, but in young females the gorget is scarcely perceptible."

Marbled Pochard, *Fuligula marmorata*,—Canard marbré, *Fr.* An adult, rather less than the size of life, is beautifully figured. Inhabits the south of Europe, especially Sardinia and the Asiatic borders.—Habits unknown; but Temminck informs us that the sexes are similar. The peculiar marbling of the plumage at once distinguishes this bird. We question the propriety of classing the Marbled Pochard in *Fuligula*, and our author appears to be of the same opinion, at least judging from what he says of *F. rufiga*, a closely-allied species.

Foolish Guillemot, *Uria troile*—Grand Guillemot, *Fr.*—Troil Lumme, *G.* The plate represents, in a very creditable manner, an

adult and a young bird of the year, of the natural size. The native habitat of this common and well-known bird "extends throughout the northern regions of both hemispheres." It is a truly oceanic species, only frequenting rocky shores during the breeding season. It abounds on the rocky coasts of the whole of northern Europe, "whence it migrates southwards on the approach of winter, returning again with the vast shoals of fishes which pass northward in spring." "After breeding they undergo a partial moult," and "lose their primaries so simultaneously as to be incapable of flight for a considerable period; a circumstance of little moment, as they easily elude pursuit by diving, in which they excel surprisingly."

PART X.—Rock Pigeon, *Columba livia*—Colombe biset, Fr.—Haus Taube, G. Mr. Gould's figure is, in many respects, excellent, especially as regards the feathering; the shape is not so perfect as it might be. The representation is of the size of life. It is tolerably certain that this bird is the origin of the dove-cot Pigeon. Inhabits Europe and Africa, particularly the north of the latter country, frequenting rocks and deserted buildings on the sea-coast. Very common along the shores of the Mediterranean, and with us in the Orkneys; according to the author of the work before us, it is "also to be met with wherever abrupt rocks near the sea afford it a congenial asylum." Lays its two white eggs on the shelves of the rocks, and "is said to breed twice or thrice in the season." Judging by the fecundity of the domesticated race, this seems by no means improbable. Feeds on grain and seeds, also slugs, &c. The sexes closely resemble each other, but we believe a slight variation in the brightness of the rich metallic hues on the neck might serve to distinguish them.

Redbacked Shrike, *Lanius collurio*—Pie-grièche écorcheur, Fr.—Velia minor, It.—Rothrückiger Vurger, G. This bird is not known in Scotland, but is the commonest of the genus in England, especially in the midland and southern counties, arriving at the close of April or the beginning of May, according to the forwardness or otherwise of the spring. Also inhabits the whole of Europe and North Africa. It frequents downs and open pastures, singly or in pairs, and is partial to hedge-rows. Feeds on grasshoppers, beetles, and "the larger kinds of flies, which it often takes on the wing," in a similar manner to the Flycatcher. It is also "known to attack young and feeble birds, mice, lizards, slugs, &c., which," like most of its congeners, "it impales on a sharp thorn or spike previously to tearing them to pieces." "Builds its nest in sharp thorny bushes, often at a considerable distance from the ground, construct-

ing it of dried grasses and wool, with a lining of hair." The eggs are five or six, pinkish-white, "with spots of wood-brown disposed in zones, chiefly at the large end." The female is at once distinguished by the absence of the grey hood and the black streak on the face. The plate represents an adult male and a young male. Both are good, the latter unexceptionable.

Common Ruff, *Machetes pugnax*—Bécasseau combattant, *Fr.*—Gambetta scherzosa, *It.*—Streits Strandläufer, *G.* We are presented with figures of the male in summer and winter attire, and an adult female, all of the natural size and very good. It is much less abundant in England than formerly, but is still common in the marshy districts of France, Germany, and Holland. In summer it extends northward as far as Lapland, Sweden, and Russia, where it is ascertained to breed. It is a strictly migratory bird. The Ruff is polygamous, and its pugnacity is well known. The flesh of the Ruff is considered a great delicacy, and considerable numbers are annually fattened for the table. The adult male in summer plumage is at once distinguished by its superior size, by the beautiful feathers on the neck, and by the general brightness of its tints. The male in winter attire resembles the other sex, except that the colour of the throat and breast is very much lighter in the former.

Penduline Lannet, *Ægialus pendulinus*—Mésange rémiz, *Fr.*—Beutel Meise, *G.* A pair of these pretty little birds, with their nest, are figured; we do not particularly admire the plate. Inhabits the south of Europe, frequenting the margins of rivers and inland lakes, especially where reeds, willows, &c., are plentiful. Its habits much resemble those of our Bearded Pinnock, *Calamophilus biarmicus*. Feeds on seeds, aquatic insects, and small mollusca. We believe the Pinnock likewise subsists on all the above kinds of food, though Mr. Gould appears to think otherwise. The nest is "constructed of the soft down of the willow or poplar, and this substance, which closely resembles cotton wool, is interwoven together with admirable ingenuity, so as to form a flask-shaped nest, with a lateral opening into the internal chamber. It is suspended at the extremity of a drooping branch of a willow, or any similar tree, overhanging the water." The eggs, five or six, are pure white, marked with a few red blotches. The colours of the female are more dingy than those of the male; young birds want the black mark on the face.

An adult male, in the breeding plumage and natural size, of the Roseate Tern, *Sterna Dougalli*—Terne Dougall, *Fr.* A very pretty and well-executed figure in many respects. The delicate rose colour

on the breast, and the slender black bill, distinguish this species from the rest of the genus. Its flight is peculiarly buoyant. Abounds particularly in the southern regions of the Old World. Its cry is said to be somewhat like the word *crake*. "Its eggs much resemble those of the Arctic Tern, but are a little larger, more pointed at the small end, with the ground-colour inclining to cream white or pale wood brown." Food and habits similar to those of the other Terns. Time of arrival "the same as that of the Sandwich and Arctic Terns, and by the end of September nearly the whole of them have departed for warmer latitudes." The sexes do not differ.

Pied Woodpecker, *Picus major*—Pic épeiche, *Fr.*—Picchio vario, *It.*—Bunt Specht, *G.* This is an exquisite plate, representing, of the natural size, a male and female, and the young stretching their heads out of the hole of a tree to receive the food their mother is conveying in her bill. The female especially is admirably executed. Common in all the wooded portions of Europe, including Britain. Feeds on insects and their larvæ, which it seeks on the trunks of trees or on moss-grown rails; likewise "commits great havoc among cherries, plums, and wall-fruits in general." Flight short and rapid, and manners brisk and lively. Lays in holes of trees, sometimes excavating these to a considerable depth. Colour of the eggs, like those of other Woodpeckers, glossy white. The male is only distinguished by the occipital band of scarlet. It is, however, a singular and apparently unaccountable fact, that "the young of both sexes, for the first three or four months of their existence, have the whole of the brow scarlet," whereas the adult female has no scarlet at all on the head, and the male has only the narrow occipital band above alluded to.

Marsh Sandpiper, *Tringa stagnatilis*—Chevalier stagnatile, *Fr.*—Teich Wasserläufer, *G.* An elegant figure of the adult male, winter plumage and size of life. In form it resembles *Totanus fuscus*, but it is little more than half the size of that bird. Does not occur with us, and is very rare on the continent, though it extends "from the north of Europe, its summer habitat, throughout the eastern provinces, as far as the Mediterranean, frequenting the borders of large rivers, but never taking up its residence on the sea-shore." Obtains its food in marshes and similar places. The summer plumage of the male is lighter on the upper parts; the young have those parts brownish-black, each feather being bordered with yellow. Total length of the adult male about nine inches.

Little Bittern, *Botaurus minutus*—Héron blongios, *Fr.*—Sgarza

guacco, *It.*—Kleiner Reiher, *G.* Figures, natural size, of the adult and of a young bird in intermediate plumage, are given. The same fault is observable in this plate as in the majority of Audubon's drawings, namely, too great a straining after pictorial effect. Mr. Gould considers that the Little Bittern ought to form a genus fully as distinct from *Botaurus* as this latter is from *Ardea*. In England it is a rare bird, but it abounds in many parts of the continent, especially the southern provinces. "From the seclusion of its haunts and the difficulty of its access, its nest is seldom seen; it is said to be placed in low bushes and tufts of herbage, amongst the thickest rushes." The eggs, five or six, are pale greenish-white. The body of this bird being remarkably compressed, it is enabled to elude pursuit with ease, by threading the interstices of the rushes, &c., which it frequents. Like the other Herons, it frequently perches; its flight is short, slow, and heavy. Feeds on small fishes, frogs, snails, insects, and the like. The sexes are similar, and the young are distinguished by the absence of the green on the head and back; they pass through several stages before arriving at maturity.

Maguari Stork, *Ciconia Maguari*,—Cicogne Maguari, *Fr.* This large and handsome bird is well figured, less than half the natural size. It cannot be termed a typical species, being, in fact, an approximation to the form of the genus *Mycteria*; but its habits much resemble those of the White Stork. Its true habitat is America, and the bird is only an accidental visitor to Europe; it has never occurred in Britain. Nidification and eggs unknown. The whole of the body is white, except the quills, secondaries, and upper tail-coverts, which are glossy greenish-black; bill greenish-yellow, passing into dull blue at the tip; tarsi and toes red. The Maguari Stork is "considerably larger than the White Stork."

Little Zapern, *Zapornia pusilla*, *Steph.*,—Poule d'eau pousin, *Fr.*,—Galinella piccola, *It.*,—Kleines Rohrhuhn, *G.* An adult male and a young bird, size of nature, are represented; the figure of the male is exquisite. The Little Zapern has only been met with two or three times in this country, but is common in the eastern parts of Europe; more rare in Holland and the north of France. Frequents marshy tracts, but also sometimes higher grounds. It dives with ease, and can remain under the water a considerable time, with only the bill above the surface; it also runs with celerity amongst the rushes, but is very difficult to rouse, even with the assistance of dogs. Feeds on insects, slugs, seeds, and other animal and vegetable matters. Nidificates among reeds, on the broken stalks of rushes and various aquatic herbage, and lays seven or eight

oval-shaped eggs, yellowish-brown, with elongated marks of dark olive brown. Young birds are of a much lighter colour than adults. Mr. Gould believes the "Olivaceous Gallinule" and "Little Gallinule" of Montagu to be identical with the present species.

Common Kite, *Milvus vulgaris*,—Milan royal, *Fr.*,—*Falco collared-furcata*, *It.*,—Rother Milan, *G.* We must confess this plate does not please us; nay, in the somewhat tame figure we did not at first recognize the beautiful bird it is intended to represent. It can scarcely be said that any of the illustrations in the *Birds of Europe* are *bad*, and, comparatively with most other ornithological works, very few are indifferent. The Kite is equally, but sparingly, distributed over the British Islands; but is much less common than formerly. On the continent it has a wide range, appearing to inhabit all the well-wooded districts. The elegance of the aerial evolutions of this bird must be familiar to most of our readers, either by description or actual observation. "Its prey, which consists of mice, rats, leverets, young gallinaceous birds, ducks, reptiles, fishes and insects, is sought for while it is soaring in the air at a moderate distance from the ground, and is taken by a swoop so noiseless and rapid, that little or no warning is given of its approach; in this way it sometimes commits great havoc among young broods of poultry, pheasants, partridges, &c." The nest is constructed, early in the spring, of sticks, lined with wool and hair, in the densest part of the forest. The eggs, three or four, greyish white, spotted with reddish-brown. Sex and age effect no very remarkable changes in the appearance of the Kite. The figure, of an adult, is three-fourths of the natural size.

Lapland Longspur, *Plectrophanes Lapponica*,—Bruant montain, *Fr.*,—Lerchin Spornier, *G.* It is not at present known whether the adult male of this species loses its strikingly contrasted colours in winter or not. The Lapland Longspur breeds within the arctic circle, but it passes southward in winter, in Europe as far south as Switzerland, and in America visiting the northern parts of the United States. Dr. Richardson informs us that the nest is "placed upon a small hillock, among moss and shrubs, and is composed externally of the dried stems of grass, interwoven to a considerable thickness, and lined very neatly and compactly with deer's hair. The eggs are usually of a pale ochre yellow, spotted with brown." Its food consists of the seeds of mountain plants, &c. It appears to be an almost exclusively terrestrial species, from the circumstance of the British-killed specimens having been met with amongst vast quantities of Larks in the London markets. The females and the

young of both sexes are destitute of the varied plumage which characterizes the adult male. The plate represents an adult male and a young bird of the year, pleasingly executed, of the living proportions.

An adult male, natural size, of the Hawk Surn, *Surnia funerea*, —Chouette caparech, *Fr.*, —Habichts Eule, *G.* A beautiful figure. The habitat of this bird extends throughout the arctic regions of both continents, and it occurs in France and Germany, but not in England. The Hawk Surn is often seen abroad in the day time; and this, in conjunction with its habits and structure, points out the passage effected between the Harriers and the typical *Strigidae* by this species. It builds in trees, and lays two white eggs. The sexes offer no material difference.

Common Serin, *Serinus flavescens*, Gould, —Grosbec serin, *Fr.*, —Girnitz, *G.* We perfectly coincide with our author in the expediency of removing the Serin from the genus *Fringilla*. The native habitat of the Common Serin is limited to the south of Europe, in many parts of which it is very abundant, frequenting the margins of rivers and lakes, especially where the Willow and Alder abound. "It is also common in copses and orchards, where it breeds, making its nest, which is of small dimensions, in low trees and bushes, of vegetable fibres and grasses lined with wool." The female and young want the yellow on the forehead. Beautiful figures of this elegant little species are supplied in the plate before us.

Common Wigeon, *Mareca penelope*, —Canard siffleur, *Fr.*, —Anatra marigiana, *It.*, —Pfeif Ente, *G.* Lovely figures of the male and female, rather under the natural size. The Wigeon abounds in our lakes and rivers in winter; also occurs in considerable numbers in the lowlands of the continent. It is a vegetable feeder, nibbling the grasses, &c., on which it subsists, near the surface of the water. Although most of these birds take their departure for the north in spring, a few stragglers probably remain and breed in this country. Lays eight or ten dull greyish-green eggs. It is impossible to mistake the sexes.

Blackheaded Xeme, *Xema melanocephala* —Mouette à-capuchon noir, *Fr.* An individual is very well figured, natural size. In winter the jet black on the head, characteristic of the species, changes into white. Common in southern Europe, especially along the shores of the Adriatic; also abundant in Dalmatia, in the marshes, on which it breeds. Feeds on small fishes, slugs, and marine insects.

We next find excellent figures of a pair of Cirl Buntings, *Embe-*

riza cirrus—Bruant zizi, *Fr.*—Zivolo nero, *It.*—Zaun Ammer, *G.* Hitherto, we believe, the Cirl Bunting has been supposed to be entirely confined, in England, to the southern counties; but we are happy to be enabled to extend its range as much further to the north as Doncaster, an individual having been shot, about five miles from that town, in the spring of 1837. Inhabits the south of Europe generally, and resembles the Yellow Bunting in habits. The nest, constructed of dried grass intermingled with vegetable fibres, and lined with hair, is placed beneath a low bush, or at the foot of a low tree. The eggs are of a rounder shape than those of the Yellow Bunting, and grey, marked with dark zigzag lines. Feeds on grain and insects, especially grasshoppers. The female has no black on the throat.

Green Cormorant, *Cormoranus cristatus*—Cormoran largup, *Fr.* An adult in the summer garb and a young bird are figured; the latter is especially good. This species is easily distinguished by the intense green colour of the body. Inhabits the north of Europe, and as far south as the shores of the Mediterranean. Frequents rivers and rocky sea-coasts, and feeds on fish. Constructs its nest on the upper ledge of some bold precipice, forming it of dried seaweed; the eggs, from two to four in number, are "of an oblong shape and white colour, with a rough calcareous surface. The young are at first quite naked, but are afterwards covered with black down. The young of the year are of a much lighter hue than adults.

Spectacle Fauvet, *Ficedula conspicillata*—Becfin à-lunettes, *Fr.* The plate represents, in an admirable manner, a pair of these birds, which much resemble the Whitethroated Fauvet in appearance and habits. Spain is the only recorded locality for its occurrence, and the nidification is unknown. The plumage of the female is paler than that of the male.

This Part of the *Birds of Europe* closes with a fine representation of the Black Cormorant, *Cormoranus graculus*—Cormoran nigaud, *Fr.*—Krahen Pelikan, *G.* Mr. Gould is convinced that this species has no claim to a place in the British fauna. According to Temminck it inhabits Holland, and enjoys a wide range through the northern latitudes of both worlds. It is migratory in eastern Europe, but Mr. Gould has never met with specimens from the localities assigned by the Dutch professor. "The plate represents an adult bird, about three-fourths of its natural size, assuming the white dots and crest of the breeding season."

CONTRIBUTIONS TO THE BOTANICAL GEOGRAPHY OF THE SOUTH OF EUROPE.

BY PROFESSOR LINK.

THE Flora of a country constitutes one of its chief characteristics : to ask why a plant occupies this or that locality, is to ask why the Crow has not the plumage of the Peacock. It is not easy to find plants which characterize the longitude of a place, as well as its latitude and altitude. Those must be selected which are widely distributed, viz., those which Humboldt calls social plants, which are not readily propagated by means of their seeds—as these may be easily conveyed from one country to another—and least of all those which grow amongst corn. Our beautiful corn-flower (the *C. cyanus*), which ornaments our northern fields, I, however, once found in Portugal. And when even the selection be made, it is requisite to have been long or frequently in a country to define with accuracy the limits of a plant.

It is a well-known fact that many, but not all, of the plants of the northern plains are found in the south, upon the mountains ; and although such plants may very conveniently indicate the climatic analogies of mountains, yet they cannot be applied to the determination of the climatic analogies of plains whence, at all events, we start. They likewise must ascend mountains by degrees, and not make the extraordinary leap of the Sandthorn, *Hippophaë rhamnoides* ; for we can travel from Rügen to Geneva without finding it but at those two places. It is fortunate when the characteristic plant is so well known as not to require accurate botanical knowledge to make the requisite determination. The Common Whortleberry, *Vaccinium myrtillus*, is a plant well adapted to indicate the elevation of the surface. It grows in northern Germany, in the woods of the plains. It then gradually ascends. At Friburg, in Baden, it is found only upon the higher mountains ; in Switzerland, which itself is much elevated, it grows in the woods of the first range of Alps, and is then again not found until we reach the high *Alpe di Caporagheno*, above Fivizzans, where it grows in the meadows with *Colchicum autumnale*. It was there met with by my deceased friend, Fr. Hoffmann, who visited the spot shortly after me. And, lastly, it is only again to be found upon the elevated Majella, in the Abruzzi.

But we will return to the plains, and there observe the plants which

form the vegetable line of demarcation of the south of Europe. After having entirely left the Alps, we observe an universally-known plant, the Lavender, *Lavendula spica*. It is found upon the sunny hills around Verona ; it is very abundant beyond Coni, towards the Colde Teuda, there following the chain of mountains. It thence passes to the south of France and Spain, where, in Arragon, it is still abundant ; but lower down, in the plains of Castile, it is not found, nor does it present itself in Portugal. It likewise terminates near Rome, and appears only on the high mountains on the coast of the Adriatic. It is not an eastern plant ; in Istria its place is supplied by the *Salvia officinalis*, which there follows the Monte Maggiore, but which in Italy grows only on the high mountains of the Abruzzi.

The plains of Lombardy form a garden where scarcely a wild plant grows, at all events not one that is at all characteristic. Thus, also, the whole of the hilly Istria is covered with plantations of Olives ; and it is only between these that it is observed that the region of Myrtles commences. The Myrtle, hence, is the shrub which follows the south. It covers whole districts in Portugal, and by the side of brooks, especially, it becomes a tall and beautiful plant. It thence passes on through central and southern Spain, the most southern part of France, as far as the coasts of Genoa. It is everywhere found in the papal states, and around Naples, and occupies the whole of Istria, as far as Monte Maggiore. It, indeed, stretches further south, but becomes gradually more rare ; and in the north of Italy it is only seen in solitary situations. Further towards the south, on passing the land of Myrtles, we come into that of the Rosemary, or, more precisely, of the Oleander. It commences near Merida, in Spain, follows the course of the Guadraria as far as Agamonte, where formerly the good King Jargatai reposed in a grove of Laurels ; it then fills the valleys of Algæra with its beautiful blossoms, whilst the Serra di Monchique is studded with the flowers of the *Rhododendron ponticum*. It is only found in the hot valleys of Calabria and Sicily. When along the road to the ancient Troeza, after having wandered in the Morea for many leagues, beneath a burning sun, over arid waterless mountains, but sparingly sheltered by solitary and not high wild Pear trees, *Pyrus cuneifolia*, it refreshes the weary and thirsty traveller to behold a long stripe of Oleanders in the distance, twining around the mountains, with solitary plaintains rising above it ; for he is sure to find there a brook to quench his thirst, and the Plaintains promise a re-invigorating shelter. These are the three vegetable regions of the south of Europe, in their order of succession from the north to the south. We will now turn to the lines

of demarcation from the west to the east. It is not difficult to find plants which indicate these divisions, for the Pines and Oaks readily supply them.

The *Pinus sylvestris* does not pass the alpine peaks towards the south, nor does it present itself beyond the Rhine to the west; that is to say in its wild state. Plantations of it have frequently been formed in France. A large and beautiful tree, which is disfigured only by its grey green leaves, the Pinaster—*Pinus pinaster*, Lam.; *P. maritima*, De Cand.—forms the large forest of Leira, in Portugal, but which Don Diniz planted from indigenous seeds. It is of a very different appearance to the German Fir—for it forms a pyramid, and not a crown; the branches spring at right angles from the stem, and the leaves are very long, and dark green. It stretches itself throughout the whole of Spain as well as the south of France in the vicinity of the Mediterranean, as far as the coasts of Genoa, both di Ponenti and di Levante. It is recognized by the form of its extended branches; but it soon terminates, and in its place we find the Pine of Aleppo—*Pinus halepensis*—as it is called by botanists who have adopted the very laudable principle of altering no name, however incorrect it may be. Its long and extremely delicate leaves sufficiently characterize this tall and beautiful tree. It belongs to Italy, and indeed to its plains; but a different and equally beautiful Pine occupies the mountains, with which we have not been long acquainted, the *Pinus Lariccio*, which is found upon the mountains of Corsica, Calabria, and upon Etna, of about the size and height of the Red Fir, *Picea excelsa*. It was formerly found upon the lower mountains of Italy, on the coasts of Genoa; for Strabo says wood is felled there for masts, it is exported, and in lieu they receive oil which is not procured at Genoa: it has now become precisely the contrary. Some few years back, when the ground was removed for the foundations of the Carlos Theatre, at Genoa, Pine-apples were dug up, one of which Viviani, of Genoa, showed me, and it agreed exactly with the Pine-apple I had brought from Etna.

Further towards the east, we meet with the Grecian Pine, *Pinus maritima*. This is not a high tree, but it has a beautiful crown and long bright green leaves, and this colour distinguishes it very strongly from all the other species of Pine. I have found it wild nowhere but in Greece. It is very numerous in ancient Attica. From the Acropolis there is seen in the distance, upon the sacred road to Eleusis, a wood consisting of these trees, but which has now become much opened. These woods are also seen upon Hymettus, also upon the promontory of Sunium. In going from the hilly plains of

Megara to Corinth, the road suddenly rises towards the Isthmus, and we enter a forest of these Pines. On the right rocks rise; and the mountains, up which the road winds, become higher and more precipitous. The narrow arm of the sea and bay is almost closed by the island Salamis, which, now deserted and uninhabited, lifts up its innumerable mountain peaks. The road hangs over the sea, upon the edge of a lofty precipice, and would create giddiness did not a friendly hedge of Mastic protect from danger as also its apprehension, and permit us to enjoy without anxiety the beauties of the prospect. The traces of walls are still seen amongst the rocks. Here dwelt, in remote antiquity, the bandit Pityocampos, who bound the unfortunate wretches that fell into his hands between two Fir trees bent downwards together, and killed them by this dreadful death. This story is not improbable; for those Firs are low: with ours it would have been impossible.

In the Morea this tree is not numerous, and it is found only upon the northern coasts. The valleys of Epidaurus are adorned with it, as are also the mountains of Ægina. It is most beautiful at the foot of the elevated Cellene towards the sea, and upon the rough banks of the river Xylocastro, which falls down from the mountains, it becomes a beautiful tree with a broad crown. On the southern coast of the Morea it is rare, and the western coast is occupied by the *Pinus halepensis*.

The three Pines—*P. Pinaster*, *P. halepensis*, and *P. maritima*—characterize three regions of southern Europe, from east to west: and the same is the case with three Oaks. In Spain and Portugal is found the Oak which bears edible acorns, and which was well known to the ancients. Desfontaines re-discovered it upon the mountains of Algiers, and called it *Quercus ballota*: and Count Hoffmannsegg and myself were the first to inform botanists that it grows in Spain and Portugal; but that, for the sake of its fruit, it is cultivated near Pontelegre, in Portugal, in forests, and these acorns are roasted with chesnuts and sold at the gates of Madrid. In Italy a different Oak is found, with edible fruit, and which M. Zenore, singularly enough, considers a variety of our Oak, *Quercus pedunculata*. And in Greece, lastly, we find the *Quercus ægilops*, the tall, slender, and beautiful *Vellanida*, the Arcadian Oak, the fruit of which the ancient Arcadians—the *βαλανίφαγοι ἄνδρες* of the Pythia—eat, and the cup of which, by the name of “knopper,” is carried to Germany. The last is the Oak which bears the gall-nuts, *Q. infectoria*. It first presents itself on the eastern edge of Greece, and becomes abundant in Natolia.—WIEGMAN'S *Archiv.*, 2, 4, 328.

REMARKS ON MUSICAL PRECOCITY.

ILLUSTRATED WITH CASES.

BY J. L. LEVISON.

IF I had the technical knowledge of music possessed by the talented writer of the article "On the Present State of the Opera," in the last number of *The Analyst*, I might hope to render this paper more generally interesting. I shall, however, only give a notion of the cerebral organization of some prodigies as infantile professors, with the intention of adding my mite to our psychological information. In order to render my thoughts practical, I propose examining the following propositions: that, in most cases of an early manifestation of musical talent, there are larger anterior lobes than in commonplace children; and that, in the cases of musical precocity which I have investigated, there have been observed two conditions, 1st. That the parent or parents have been themselves musical; 2nd. That all the nervous energy, or, as it is termed by physiologists, the sensorial power, is abstracted for the purpose of developing faculties predisposed to activity, and others are deprived of the nervous stimulus.

I select the three cases which follow, as illustrating my views. 1st. Master Phillips, called "The Infant Trumpeter;" 2. Master Shaw, a juvenile organist; 3. Master Manton, usually announced as "The Infant Paganini."

REMARKS ON THE CEREBRAL ORGANIZATION OF
MASTER PHILLIPS.

I took the phrenological development of Master Phillips a short time since, whilst on a visit at Hull, and previously to hearing him perform. He is about ten years old, thin and pale, being of a nervous temperament. His head is above the average size, and the anterior lobes are deeper than broad—that is, they possess greater length than breadth of fibre, particularly in the reflective region. But the lower portions of the middle lobe, and part of the posterior lobes, have breadth as well as length; or, in other words, the feelings are large which impart energy to the character and give greater vividness to combinations of the intellectual faculties, so as to *individualize* a person for any specific or particular talent. The organs

of Combativeness, Destructiveness, Secretiveness, Constructiveness, Self-esteem, Love of Approbation, and Firmness, are very large ; as are also most of the organs of the moral group, and many of the intellectual faculties. Taking a front view of the forehead, the lower and outer portions seem contracted, owing to the upper and lateral portions being so much expanded ; but a profile view shews a greater proportion of brain before the ear than there is behind it. His chest is rounded and full, arising from the particular action of the pectoral and intercostal muscles, and their long-sustained activity ; but the abdomen is small.

Having thus given some idea of the cerebral and bodily organisation of Master Phillips, we may proceed to treat of his intellectual qualifications, which are in accordance with the former, and may be anticipated by even the tyro in Phrenology.

He plays the trumpet with apparent ease, and seems nothing daunted, whatever may be the number of his auditors. He takes applause as a matter of course, but it does not seem to puff him up with pride, although there is no doubt that the great admiration he receives acts as a powerful stimulus to Love of Approbation, giving him the peculiar smile which this latter feeling imparts when circumstances excite its activity. Nor must we wonder if such a child should experience something like vanity, when we reflect that even the matured philosopher is not proof against it, particularly when he is made the *lion* of his day. Master Phillips's performance as a trumpet-player is astonishing, considering his age ; and he has excited surprise and admiration everywhere, not only among amateurs, but also among professors of music. The combination of the faculties essential to the musician are, some of them, above the mean average of his other perceptive powers. The organ of Time is very large, and Melody, Order, and Number, are full ; whilst Imitation, Ideality, and Constructiveness, are very large. There is one peculiarity in the forehead of this child ; the organ of Comparison is so very large that it imparts a singular and particular expression. And I have observed that when any of the mental faculties are in excess, they impart to the mind a something which indicates that they influence the character. But as the education of Master Phillips had been neglected, if we except the culture of his musical faculties, I confess that it puzzled me very much to conjecture how Comparison would manifest itself in him. When, however, I heard him play a concerto, with variations, it was no longer a marvel to me, because the powerful influence of Comparison was indicated in the variations, which were played with great taste and discrimination, pre-

serving distinctly the original air, and never sacrificing the rules of harmony and melody for any clap-trap temporary applause. Mentioning these observations to his father, he told me that, when a mere child, he would immediately detect the resemblance of airs (if there existed any) of different composers, and he would point out the exact difference between them; and when his infantile mind could not express its thoughts in words, he would whistle first the one air, then the other, and, with a quickness of gesticulation and pantomimic language, call attention to any actual or supposed resemblance between them.

MASTER SHAW,

ORGANIST TO ST. PETER'S CHURCH, DRYPOOL, HULL.

Master Shaw is robust, but small in stature, being fifteen years old. He has rather a large head, and his temperament is nervo-sanguineous. At the present time he is a pupil under Mr. Skelton, a very talented musician. He plays on the organ with taste (Ideality is large); his execution is excellent (Imitation is large); his manipulation is surprising for one so young (Constructiveness is very large); and he has an excellent moral organization, with large Self-esteem, Love of Approbation, and Firmness; and, even when singing before large audiences at the Hull concerts, he is never abashed. Master Shaw gives evidence of the accuracy of his perception of melody that he is quite an improvisatore, astonishing those who hear him with the sweetness, power, and harmony he displays when performing the voluntary.

MASTER WILLIAM MANTON,

COMMONLY CALLED "THE INFANT PAGANINI."

This child is not quite six years old, of a nervo-bilious temperament, and with a head which is much malformed in the lateral and posterior regions, but, as in other cases of precocity, the anterior lobes are large. The sentiments and feelings are also strongly developed, particularly those which give confidence, taste, skill in execution, and the power of expressing the thoughts of a composer. The organs of Self-esteem, Love of Approbation, and Firmness, are very large, as are also Constructiveness, Ideality, and Imitation; and Order, Number, Individuality, and Eventuality, are very large: Time is full.

Master Manton is travelling with Mr. F. A. Beverley, vocalist

and guitarist, and he plays on the harp and violin. I attended a "Musical Melange," and was delighted with the little premature performer. He played the Cuckoo solo, and also St. Patrick's Day in the Morning, on one string (*à la Paganini*), and an air on the harp, with variations. It was a feeling of surprise and admiration we experienced when watching this little boy run his puny finger along the strings of the harp, and bring out the tones with great skill, considering his tender age. It was, however amusing to see this little fellow, at the conclusion of each stanza, give the *Paganinian* shake of his bow with all the proud consciousness of superiority, and with as much an air of triumph as the mighty Italian himself, whose flourish of the bow seemed to indicate that he was the prince of violinists and a musical magician.

I should deem it a comparatively profitless task to trouble your readers with these little sketches of the musical triumvirate I have named, if I did not hope to make their history a means of explaining my own thoughts on musical precocity. From many observations I have made, the early development of a genius for Music or Painting may be referred to hereditary influence imparting a tendency to some organs to become more active than others, and to the circumstances in which such supposed prodigies are placed. The circumstances sometimes may appear to be adventitious means of developing their innate tendencies, or certain plans may be made to call forth and foster any indications of particular talent. It may further be stated, that in most instances of early genius the sensorial power is concentrated and engrossed by a few faculties, to which it imparts an unhealthy energy. In Master Phillips's case, we have seen that his mental activity is in one direction, and hence his powers of musical perception and of the relative duration and intensity of sounds. His history confirms my opinion that his particular bias is referable to causes preceding his birth, and from others in subsequent operation, which conjointly rendered him a genius. The proofs I offer are these: his father was master of a band and played on many instruments, having quite a passion for music:* he would therefore impart a tendency to the faculties of Melody, Time, &c., and predispose them to be susceptible of being easily excited; and when the child "breathed the breath of life" music was used as a means of amusement. But the discovery that the baby musician

* By passion I mean a very high state of excitement of particular powers, arising from excessive activity and great stimulation.

preferred the trumpet to every other instrument may almost be regarded as accidental. This was ascertained by the fact that when he was crying no other music would pacify him—that a few notes from the trumpet would have a magical effect in stopping his unmusical screaming; and by this means only his sorrow or anger was changed to joyous mirth and unrestrained expressions of pleasure. He would listen to this instrument not only with evident satisfaction, but with some symptoms of abstraction. Yes, so great was his love for the “war-stirring sounds” of the trumpet, that when tired, cross, and nearly asleep, he would be immediately roused by its shrill notes, and appear lively and excited. After many such experiments, Mr. Phillips determined to cultivate his interesting child, and encourage his particular predilection. For this purpose he used to play for hours on the favourite instrument, and the young pupil listened and smiled, and imitated as well as he could the notes or the air. It was in this way that the child was educated for a musician, and expended all the energy of his mind (the sensorial power) on this one pursuit, which has rendered his organs of Melody, Time, &c., active and vigorous.

In the case of Master Shaw there is similar evidence of his receiving a musical bias from his father, who not only had a decided taste for music, but had cultivated it to such a degree as to be considered respectable in the art, and is now principal bass singer at the High Church, Hull. His son had, therefore, a musical tendency transmitted to him by his father; and as the boy’s taste for music was early manifested, every opportunity was taken to cultivate it. I may further remark, that it does not appear to be a mere matter of accident or caprice the choice which infantile professors make as to the kind of instrument or the composition they show a preference for. Phillips’s organization makes him delighted with martial music, and Shaw’s with sacred music; the one evinced, even as a baby, an extreme pleasure for the trumpet, and the other for the organ.

If the cases of Phillips and Shaw confirm my views, there is still more corroborative proof in the personal history of Master Manton. His father, I am told, is a musician, and had brought up another son to be a public performer on the harp. But probably charmed with the immense fortune which Paganini was receiving, he was determined to make little William eminent on the violin. Be this as it may, it is a matter of fact that little Manton, even from a baby, was in love with “the harmony of sweet sounds;” and all his mental energy was directed to this one object. William Manton is

very clever for his age, but he has been entirely neglected in his education ; and I am informed that he has been exhibited, night after night, at public houses and taverns. Very often, moreover, when tired and worn out, he has been roused from his sleep and put upon a table to play to the company resorting to the above places of entertainment ; and his health has materially suffered from such unnatural stimulation of the brain. To give some idea of the exercise he has had, I may say that he will tell any note of any string struck ; and such is the nicety of his perception, the accuracy of his judgment, and his knowledge of the relative duration of musical notation in the most complex composition, that he instantly detects any violation of melody and the slightest discrepance in the harmony of it.

But although it is pleasing and astonishing that a young child not six years old should play on the harp and violin with admirable taste and correctness, we must regret that such perfection can only be attained at the expense of health and the neglect of all or most other intellectual pursuits—pursuits which are more important in point of utility, and which render men useful in their generation.

In conclusion, I would observe that if any boy, with a good temperament and large anterior lobes, had the musical group early and constantly cultivated, and if care was taken to select the kind of composition suitable to the organization of the individual, there is no doubt but that he would manifest that degree of talent for music which constitutes genius. Hence we arrive at data for making musical prodigies. We have only to give exclusive attention to the child, and concentrate the nervous energy of the brain (the sensorial power) to the perception of sounds, their relative duration, and their comparative intensity ; and if our pupil is the child of musical parents it would be so much the better, and would expedite the results we have anticipated. It is true we admire such talented children ; but I repeat that the distinction is purchased at a very dear price—the loss of health and of general and useful knowledge.

UPON FOSSIL INFUSORIA.

BY C. G. EHRENBERG.

M. C. FISCHER, the proprietor of the manufactory of porcelain at Pirkenhammer, near Carlsbad, has observed that the substance resembling siliceous concrete, which occurs in the peat bogs near Franzensbad, in Bohemia, consists almost exclusively of the armour of some species of *Navicula*.

Together with this information, M. Fischer sent me a piece of the siliceous mass, about 2" long, 1" broad, and $\frac{3}{4}$ " high, as well as some specimens of the peat, intreating me to ascertain the animal, and to publish the result. Microscopic inspection immediately confirmed the discovery of M. Fischer, that the siliceous concrete (*kieselguhr*) of Franzensbad consisted almost exclusively of very well preserved *Navicula*, with which other *Bacillaria* were intermixed; and the perfect transparency of their siliceous armour, and its purity from all organic matter, renders it probable that an unusually intense heat had purified them and amassed them together. It is improbable that they should have originated at the bottom of the sea; for the majority of the animals, both in form and the relative numbers of their striæ, correspond very accurately with those of the *Nav. viridis*, which is found in all the fresh-water about Berlin, as well as elsewhere. In the specimens of peat I could also recognise *Navicula*, yet they were generally different, though still existing species, fewer in relative proportion, and the prevailing forms very different.

Original specimens of the siliceous concrete (*kieselguhr*) of the Isle of France and of Santa Fiora, in Tuscany, which were analyzed by Klaproth, shewed that they likewise consisted almost exclusively of the envelopes of infusoria of several genera of *Bacillaria*, yet sometimes of the same and almost all still living species, in conjunction with rare siliceous spicula of fresh and sea-water sponges, without any intervenient binding material. This, therefore, is an additional confirmation of Kühzing's discovery, that the armour of the *Bacillaria* consists of *silex*.

I myself discovered, several years ago, that the ochraceous slimy substance which sometimes covers the bottom of marshy brooks and moats, and which appears to have been considered as a deposit of the oxide of iron, is a very delicate *Bacillaria*, which, at a red heat, becomes red like the oxide of iron, and contains much iron, but does not

lose its form either by a red heat or upon being treated with acids, and, consequently, possesses siliceous armour most approximating to that of the genus *Gaillonella*. I therefore figured it last year as *Gaillonella ferruginea*, in plate ten of my *Infusorien Codex*, which will now soon appear. The above circumstances make it probable that *G. ferruginea* played an important part in the formation of bog iron, either by the direct amount of its own iron or by the attraction of all in its vicinity.

The following are the fossil species of infusoria which I have detected in the above-named substances:—I. In the siliceous concrete (kieselguhr) of Franzensbad: 1. *Navicula viridis* of very different sizes, the largest $\frac{1}{4}$ ", forming the major part of the mass; 2. *N. gibba*; 3. *N. fulva*; 4. *N. Librile*; 5. *N. striatula*; 6. *N. viridula*; (the last two are salt-water animals, all the first are inhabitants of fresh water); 7. *Gomphonema paradoxum*; 8. *G. claratum*; 9. *Gaillonella varians*? all fresh-water animals—none to be distinguished from the living species. II. In the peat of Franzensbad: 1. *Navicula granulata* is the most numerous, and was hitherto unknown; 2. *N. viridis*, rare; 3. *Bacillaria vulgaris*? 4. *Gomphonema paradoxum*; 5. *Cocconeis undulata*; all living forms—the last found in the salt water of the Baltic. III. In the brugmehl of Santa Fiora: 1. *Synedra capitata*, forming the chief mass—an hitherto unknown form; 2. *S. ulna*; 3. *N. Librile*; 4. *N. gibba*; 5. *N. viridis*; 6. *N. capitata*; 7. *N. zebra*; 8. *N. phæniceutron*; 9. *N. inequalis* (all still living in fresh water); 10. *N. viridula*; (found still in salt water); 11. *N. granulata*; 12. *N. follis* (unknown species); 13. *Gomphonema clavatum*; 14. *G. paradoxum*; 15. *G. acumdatum* (all still found in fresh water); 16. *Cocconema cymbiforma* (a still existing fresh-water animal); 17. *Cocconeis undulata* (still found in salt water); 18. *Gaillonella Italica*, n. s.; 19. the siliceous spicula of a *spongia* or *spongilla*. IV. Klaproth's siliceous concrete (kieselguhr) from the Isle of France, exhibited, 1. *Bacillaria vulgaris*? constituting the chief mass; is still found everywhere in salt water; 2. *B. major* (an unknown species); 3. *Navicula gibba* (still living, both in fresh and salt water); 4. *N. alia* (sp. undetermined); 5. *N. bifrons*: all these species are not so well preserved as those in the former stones, and appear, with the exception of the latter, to be salt-water animals.

The majority of these fossil infusoria are still found living near Berlin and in the waters of the Baltic, near Wismar. The greater number are so well preserved that they may be closely inspected. Thus, for instance, it is not only possible to count the number of

the ribs, but also the six apertures of the armour of *Navicula viridis*, the four apertures of *Gaillonella*, the two apertures of *Gomphonema*, &c. The stone of the Isle of France only appears to contain a preponderance of salt-water animals. The few yet unknown forms may be considered very appropriately as still existing, although yet undiscovered, animals. What is most striking, is the preponderance of individual species which thus characterize the different stones; for instance, the *Navicula viridis* in the siliceous concrete (kieselguhr) of Franzensbad, *Bacillaria vulgaris* in that of the Isle of France, and *Synedra capitata* in the pulverulent silica (bergmehl) of Santa Flora. The still existing ones are more mixed, and live only about and upon plants, on which they feed.

Purchasable foliaceous tripel (Blätter tripel) likewise shewed that its mass equally consisted of infusoria. The polishing slate of Bilin, in Bohemia, which forms entire beds, I have discovered to consist almost exclusively of infusoria, which may be ascribed to the genus *Gaillonella* (*G. distans*). *Podosphenia nana*, n. sp., *Navic. scalprum* ? and *Bacillaria vulgaris* (the last are still living salt-water animalculæ), present themselves only occasionally; the first alone is sometimes in equal abundance with the *Gaillonella*. There are found in the same polishing slate the impressions of plants and an extinct species of fish—*Leuciscus papyraceus* of Bronn, according to Agassiz. In the adhesive slate of Menilmontant I found but thin doubtful traces of the altered *Gaillonella distans*. "An individual of this species, which forms, almost without any connecting substance, the polishing slate, is $\frac{1}{2000}$ ''' large; many are smaller, and one cubic inch of this stone contains 41,000,000,000 (!—Ed.) of these animals.

EDUCATION, AS IT IS AND AS IT SHOULD BE.

“Phrenology is a science, without which the attempt at education must ever be totally futile and unsuccessful, and its pretence nothing more than a bitter satire upon human ignorance, folly, and presumption.”—TOULMIN SMITH.

It would be difficult to point out a subject of greater interest to the philanthropist than education; and, whether considered as a duty or a pleasure, it is a subject which should occupy the foremost place in the thoughts of every one who looks forward with delight to the improvement of his species. It is a subject, however, which has hitherto been left to a degree of neglect proportionate to its merits; and although appeals have, during the last few years, been made to the public, these have been like a voice in the wilderness, and there has been little apparent progress in forwarding the cause. However, I consider it to be the duty of every one to apply himself to the removal of the errors which compose that curious system usually called a liberal education; and, accordingly, I now propose to lay before the reader a sketch of the way in which education might be conducted with a certainty of successful results, and with equal pleasure to teacher and pupil. This has been done many times by men of note; but by various means the required impression has not been made; the books of Locke, Kames, and Pestalozzi, lie on the shelf: they are praised by the tongue, but are forgotten in practice. This has, no doubt, in some measure, been owing to the want of some system by which the truth of their precepts might not only be enforced, but also *demonstrated*. I, accordingly, shall now draw an outline of “education as it should be;” and as my principal object is to *enforce the ideas* I shall promulgate, I shall in every case, where practicable, convey these in the words of some great author; for I know that the organ of Veneration is usually at least as active as Causality: and I have frequently observed, with pain, that an idea which is scouted when propounded in plain terms by an humble individual, will elicit applause and gain assent when dressed in elegant or eloquent phrases, and backed by some great authority. So much more active are the *feelings* than the *reflective powers* in the generality of mankind!

All the ideas which I shall now gather I have myself expressed long before I had access to any of the authorities which I shall have the pleasure of quoting for the advantage of my readers.

Education may be defined, the science which teaches us to cultivate the faculties with the greatest advantage, to strengthen the weak, moderate the over-active, and to combine all into one harmonious whole. It was formerly a frequently-agitated question whether general education was a beneficial thing ; but the very form of the question is founded in error ; for every human being is of necessity educated ; and it is as impossible to withhold education from the mass of mankind as it would be to deprive them of air.

The word education is derived from *e* out and *duco* to lead ; and thus simply signifies leading an organ out by exercise. One who lives among those who habitually drink to excess has his organ of Alimentiveness educated ; one who lives in combative company will have his Combativeness educated, and so on ; and in this way all the forty organs are educated according to the circumstances in which the individual finds himself. The pickpocket and the poacher are educated equally with the university youths, and the education in these cases, as in every other, commences at birth. The question, therefore, as an able writer has lately said, is not between education and no education, but between a good education and a bad education.

Education may be divided into two distinct heads:—1st, the *manner* of instructing, and 2nd, the *matter*. This distinction is very generally overlooked, in consequence of which very disastrous results ensue. “The *manner* of giving instruction,” says Mr. Owen, “is one thing, the *instruction* itself another, and no two objects can be more distinct. The worst manner may be employed to give the best instruction, and the best manner to give the worst instruction.” I am afraid that it is too frequently the case to find the worst manner and matter combined. This can only be attributed to the incapacity of the teacher ; and therefore, before entering on either the manner or the matter, it will be necessary to give a few directions, indispensable for parents to attend to in the choice of a teacher.

“Seek you to train your fav’rite boy ?
Each caution, ev’ry care, employ ;
And, ere you venture to confide,
Let his preceptor’s heart be tried ;
Weigh well his manners, life, and scope ;
On these depend thy future hope.”

In following this advice, Phrenology will be a most effectual aid. This science shows us the reason why some teachers succeed while others fail, and it likewise gives us a key by which we may discover the competent and discard the incompetent without any loss of time or money. Philoprogenitiveness is one of the organs indispensable to the teacher. Combe remarks on this organ as follows:—"The natural language of the faculty is soft, tender, and endearing. *It is essential to a successful teacher of children.* Individuals in whom the organ is deficient have little sympathy with the feelings of the youthful mind, and their tones and manner of communicating instruction *repel*, instead of engaging, the affections of the scholar. This is the cause why some persons, whose manner, in intercourse with their equals, is unexceptionable, *are nevertheless greatly disliked as teachers*; and children are generally in the right in their antipathies, although their parents and guardians, judging by their own feelings, imagine them actuated by caprice."

Every one who has had the slightest experience in the subject must feel how exquisitely true to nature is the foregoing description. Emphatically it may be said—their tones and manner of communicating instruction *repel*, instead of engaging, the affections of the scholar. And yet the parent sees nothing of this, and the poor pupil is obliged to toil wearily on, like the panting Hart on the parched desert, with not even a patch of green to refresh the aching sight.

There are other faculties equally indispensable for a successful teacher. Mr. Combe enumerates them as follows:—"Individuality, Eventuality, and Concentrativeness, are indispensable qualities to a good teacher. *I have never seen a person capable of interesting children and exciting their intellects who was deficient in both the first and second.* The manner of a teacher thus deficient, is vague, abstract, and dry, and altogether unsuited to their mental condition. These three organs large, combined with large Philoprogenitiveness, Benevolence, and Conscientiousness, and an active temperament, constitute the leading elements of a good teacher."

This passage agrees with my own experience. I have known a teacher labouring for years, quite unsuccessfully, to instruct several pupils of excellent dispositions and good capacities, and at the end they knew little more of the subjects on which so much labour and trouble had been expended than at the beginning. Before I knew Phrenology, I used to suppose, judging from the manner in which the teacher conducted his system, that he did not in reality wish to instruct, but to torment and irritate his pupils, and certainly he suc-

ceeded in this at least: but when I became acquainted with Phrenology—behold, the cause of the failure became as clear as the noon-day sun!—he had the three first organs enumerated by Combe deficient. Another master, with whom I was acquainted, had not the slightest experience in teaching; but he was completely successful with the same pupils, who were always sorry to miss a lesson with him: in him the three organs were large. Another teacher possessed two of the organs large, namely, Individuality and Concentrativeness; but the third, and most important one (Eventuality), small. When he became acquainted with Phrenology, he said he felt the deficiency; but he added that he found that science of great assistance to him, for he read over carefully the functions of the deficient organ, and was thus in some measure enabled to supply its place: and, at any rate, he then saw how far he himself was to blame for any want of progress in his pupils.

But if all the three organs are deficient, Phrenology will be of little or no use to the individual; he cannot become a phrenologist, and consequently is incapable of being a teacher. Phrenology would be to him what manure is to the stony moor, and would only encumber what it could not enrich. If Causality is likewise deficient, as in the case of the first-mentioned teacher, his case is truly pitiable. He is as incapable of grasping the science in its breadth and depth, as a fly would be of taking in the proportions of St. Paul's; and to hide the threadbare state of his mind, he would be obliged to take refuge among the "illicit processes" and "undistributed middles" of routine logic.

An incompetent teacher is one of the greatest curses of mankind, and no language can be too strong to warn parents how they put their trust in one. If an architect, or a painter, or an actor fail, they are visited with severe criticism; and nothing can more forcibly show the backward state in which society yet remains, than the impunity with which a teacher can disgrace his calling. This will not, however, last long: Phrenology will render it impossible. Let every one expose any instance of the kind that may come under his notice, and the evil will vanish. "No effort is lost." Therefore let all exert themselves in the good cause, and by degrees our island shall be ridded of a race, compared to which the slaveholders were harmless. Children were intended by their Creator to enjoy their existence—

"And yet how many weary hours
Those joyous creatures know!
How much of sorrow and restraint
They to their elders owe!"

This leads us to the *manner* of the education, which we shall consider before we enter on the *matter*. Pestalozzi has some judicious remarks on this point. For instance: "If a mother is desirous of taking an active part in the intellectual education of her children, I would first direct her attention to the necessity of considering, not only what sort of knowledge, but in what *manner* that knowledge should be communicated to the mind. For her purpose the latter consideration is even more essential than the former; for however excellent the information may be which she wishes to impart, it will depend upon the mode of her doing it whether it will at all gain access to the mind, or whether it will remain unprofitable, neither suiting the faculties nor being apt to excite the interest of the child."—This is sound doctrine; more so than that of Mr. Owen, who exactly reverses the relative importance of manner and matter. Yet here, at the very outset, we find that the self-called Pestalozzians desert their master; for not a thought do they expend on the *manner*: they only consider what language or science, and what grammar or compendium the pupils shall use.

The most interesting subject in the world may be rendered dull, tedious, and tiresome, by the manner in which it is communicated. "There is," says Pestalozzi, "a remarkable reciprocal action between the interest which the teacher takes and that which he communicates to his pupils. If he is not with his whole mind present at the subject, if he does not care whether it is understood or not, *whether his manner is liked or not, he will never fail of alienating the affections of his pupils, and of rendering them indifferent to what he says.* But real interest taken in the task of instruction, kind words and kinder feelings, *the very expression of the features, and the glance of the eye,* are never lost upon children." These passages shew Pestalozzi to have been well-versed in the philosophy of human nature. To what extent Pestalozzi was acquainted with Phrenology I am not aware; he was born only ten years before Gall, and probably knew something of the greatest discovery ever made; but, however that may have been, he must certainly have possessed an organization well-calculated to acquire name and fame in the path which he had marked out for himself.

When many pupils have been educated together, and one or two do not keep pace with the rest, it is frequently said to be a most wonderful circumstance that, although all the pupils *have received exactly the same treatment*, two or three should be behind the others. Now if all the pupils *have*, as is boasted, received the same treatment, this,

of itself, would account for some having remained behind the others ; but I flatly deny that they have received the same education. It may be very true that there have been the same number of hours in school, and the same books used, and yet the mode of education in the two instances may have been entirely different.

A pupil who has facility in acquiring that which his master teaches will be petted, and praised, and held up as a pattern of industry and good conduct, while another, whose organization happens to be fitted for other subjects, will be scowled at, and receive unworthy treatment ; and yet the former may, in reality, have no merit at all, and the latter may have exerted himself to the utmost. An able writer well remarks, "The boy's merit must be measured by his powers, and the greatest judgment of the teacher is here requisite. *To do well when he may do well easily is every man's virtue.* Christ looked carelessly on while the rich Pharisees threw of their wealth into the treasury of the temple, but the widow's mite drew forth his cry of admiration ; similarly, the boy's merit must be measured by his powers. *The reward is to him who labours, though he may labour in vain ;* to him who struggles, though he may be overcome ; in short, reward is the due of merit, *and more especially of that merit which has not already met its reward in success.*"

This, however, is an unknown tongue to the master, who all the while imagines he is pursuing precisely the same plan in both cases ; whereas, in reality, he is, in the instance of the successful boy, pampering the organs of Self-esteem and Approbateness ; while in the other, who, in nine cases out of ten, is, in reality, most deserving of praise, he wounds these organs, and systematically educates his Combativeness, Destructiveness, Secretiveness, and Cautiousness, and at the same time weakens the three most valuable organs, Conscientiousness, Veneration, and Benevolence. This is the case with numbers of pupils who are thought to have received "every advantage," and who, though possessed of excellent organizations, are set down, both by parents and teachers, as wilful, headstrong, and incapable.

Those calling themselves Pestalozzians appear to me to have nothing in common with the great educator but the name. Pestalozzi maintains that "every plan of education ought to be based on a consideration of the nature or faculties of the child." Which among the Pestalozzians has acted thus ? I question whether there are many who could tell what the faculties of the child are, much less the scope of each, and their combinations.

Again, the great educationist tells us, "A child is a being endow-

ed with all the faculties of human nature, but none of them developed, — a bud not yet opened. When the bud uncloses, every one of the leaves unfolds; not one remains behind. Such must be the process of education. *No faculty in human nature but must be treated with the same attention*, for their co-agency alone can secure success." Which of the Pestalozzians has been Pestalozzian here? Again :— "*The strictest attention should be paid to the shades of individual character and talent.*" Notwithstanding this especial injunction, the *Pestalozzians* make it a boast that all their pupils have received the *same* treatment! It is an injunction disregarded by general consent; not fifty Pestalozzis could have enforced attention to it: *nothing but Phrenology could do so.*

Now, however, we come to a point more important than the rest; one, indeed, which includes all the others. In an article of mine which appeared some time ago in *The Analyst*,* the following passage occurs :—"I think it may safely be affirmed that, if a pupil does not advance in his studies, or does not advance so quickly as he should, the fault is never his own;" and, after bringing proofs of this, I conclude :—"I contend, therefore, in every case in which the pupil remains stationary, or advances but slowly, the cause must be referred either to the ignorance of the teacher, or to the mal-organization of the pupil's brain." This was stigmatized by *Pestalozzians* as dangerous, &c. Judge, then, of my surprise when I met with the following passage of Pestalozzi :—"The *interest* in study is the first thing which a teacher, and, in the instances before us, which a mother, should endeavour to excite and keep alive. There are hardly any circumstances in which a want of application does not proceed from a want of interest, and there are, perhaps, none under which a want of interest does not originate in a mode of teaching adopted by the teacher. I would go so far as to lay it down as a rule that, whenever children are inattentive, and apparently take no interest in a lesson, the teacher should always first look to himself for the reason." Here is the same idea, in nearly the same words, by Pestalozzi himself! He even goes further than I did, for I divided the blame between the teacher and the organization; Pestalozzi throws it justly almost entirely on the former. I mention this to show how impossible it is that the mere dicta of any individual, however illustrious or successful, can place a subject like education on a firm foundation; for his followers, overlooking his precepts, will merely shelter their own ab-

* Vol. ii., p. 413.

surdities under his name, while a science is absolutely necessary for the elucidation of the subject, and that science is Phrenology, without which all systems of education must be empirical.

Education would indeed be a disagreeable and irksome occupation if the passage which the *Pestalozzians* were pleased to designate as "dangerous" were untrue. The best systems, and everything which ingenuity could suggest, might then be thrown away, all through the caprice of the pupil. But, no! the Creator has ordained that it shall be otherwise; and those who reflect at all on the matter will immediately perceive that, as Pestalozzi says, the failure in education almost always proceeds from an absence of interest, and this, again, is always owing to the unfitness of the teacher. And the phrenologists, knowing this, gave unqualified praise to that which the *Pestalozzians*, being destitute of all certain guide, pronounced *dangerous*.*

Mr. Owen, of New Lanark, goes even further than the article alluded to; he says, "From the earliest ages it has been the practice of the world to act on a supposition that each individual man forms his own character. This error cannot longer exist, for every day will make it more and more evident that the character of man is, without a single exception, always formed for him; that it may be, and is chiefly, formed by his predecessors: that they give him, or may give him, his ideas and habits, which are the powers that govern and direct his conduct. Man, therefore, never did, nor is it possible he ever can, form his own character." Mr. Owen has unquestionably effected most admirable results in his village of New Lanark, but his views possess neither originality nor soundness. Those who are interested in this subject will find their erroneousness exposed in vol. i. of the *Phrenological Journal*, by Mr. Combe, and in vol. ix. by Mr. Holm. The former well remarks, "Mr. Owen, like many of his predecessors, proceeds to speculate on the modifying power of circumstances without previously ascertaining the primitive attributes of the subject to be modified." Such a work as the *Constitution of Man*, or Gall's immortal *Fonctions du Cerveau*, will benefit mankind more than a dozen New Lanarks; for the former will put the people in the way of procuring these latter by their own exertions, independent of any individual.

All the errors in education which I have named, and many others, have been reprehended by Locke, Kames, Gibbon, Bentham, Pestalozzi, and many other great men, but all has been in vain: and what

* See *Phren. Journ.*, and *Anthrop. Mag.*

does this demonstrate? Why simply, as before stated, *the impotency of individual authority and the necessity of a science*. I therefore hope that we shall hear no longer of Pestalozzian masters and systems, and that these will give place to phrenological masters and systems. Pestalozzi himself, by the excellence of his organization, was enabled to succeed in his profession, but he could not inspire others with the same insight into the human mind as he himself possessed, even by the clearest exposition of his views, while Phrenology places a key to the mind in every one's hand. The very terms used by Pestalozzi were, in some instances, liable to mislead. Thus, a favourite term of his was "the heart." Now what is meant by this word? I never yet heard a definition of it, and without a clear understanding of the words we use we shall be liable to perpetual misapprehension. The Greeks supposed the mind to reside in the heart; hence the frequent use of the word in the New Testament. The Jews imagined that the stomach was the seat of mental manifestation, and hence we find such expressions as "bowels of compassion." But the most splendid discovery ever made has clearly proved that the mind does not reside in the stomach or in the heart, but in the brain. It may be said that those who use the word heart do not suppose that the mind really resides in that part, but simply do so from thoughtlessness or habit. But the other day, hearing some one speak of another as wanting a "bold heart," I said that the heart had nothing to do with boldness or timidity, when he answered, "Then how is it that the heart beats violently when we are frightened?" This clearly shows that he had been led away by this erroneous expression; and I have no doubt there are numbers who have some vague idea that the heart is connected with various mental feelings. Again, the word is used in very different significations. One will talk of an affectionate heart, thus attributing to that part the functions of Adhesiveness; another uses the expression "a stout heart," meaning a person with small Cautiousness and large Combativeness; while Pestalozzi, I believe, used the term to designate the moral organs of Conscientiousness, Veneration, and Benevolence. Thus we see what an endless confusion is caused by the erroneous use of one expression! I, therefore, hope that the world will join with the phrenologists in discarding an expression originally founded in ignorance, and which is calculated to continue the same. Surely every one must agree that it is a much grander and more appropriate idea that the mind is enthroned on the top, as if marking its dignified office of commander-in-chief of the whole body.

I shall conclude my sketch of the *manner* of teaching by the following excellent passage from Pestalozzi, which should be committed to memory by every teacher, though if he does not know it intuitively it may be questioned whether he is fit for his situation. "Of all tyrants it is well known that little tyrants are the most cruel; and of all little tyrants the most cruel are *school-room tyrants*. Now, in all civilized countries cruelty of every description is forbidden; even cruelty to animals is very properly punished, in some, by the law of the land, and in all stigmatized by public opinion. How, then, comes *cruelty to children* to be so generally overlooked, or rather thought a matter of course? Some, forsooth, will tell us that their own measures are wonderfully humane, that their punishments are less severe, or that they have done away with corporal punishments. But it is not to the severity of them that I object, nor would I venture to assert, in an unqualified manner, that corporal punishments are inadmissible, under any circumstances, in education. But I do object to their application, I do object to the principle that the *children are to be punished when the master or the system is to blame*. As long as this shall continue, as long as teachers will not take the trouble, or will not be found qualified, to inspire their pupils with a living *interest* in their studies, *they must not complain of the want of attention, nor even of the aversion, which some of them may manifest. Could we witness the indescribable tedium which must oppress the juvenile mind, while the weary hours are slowly passing away, one by one, in an occupation which they can neither relish nor understand the use of—could we remember the same scenes which our own childhood has undergone—we would then be no longer surprised at the remissness of the school-boy, creeping, like a snail, unwillingly to school.*" This, and a great deal more that I might quote, is admirable, but it will be entirely thrown away on a certain class of teachers,

"With eyes which scarcely serve, at most,
To guard their master 'gainst a post."

This class will almost always be found to possess low heads, and with scarcely sufficient Causality to shed even a feeble glimmer in the intricate paths of education. Yet they have generally a very comfortable opinion of themselves, owing to a large development of Self-esteem.

We shall now turn our attention to the *matter* of education. This

is a point generally as much misunderstood as the last. The *manner* chiefly relates to the education of the propensities and sentiments, of which there are twenty-two ; we now come to the treatment of the remaining organs—the intellectual—of which there are eighteen. These are the organs by which we acquire knowledge, about the value of which there can be little doubt, one should think, at the present day.

Knowledge is the most valuable acquisition within the reach of man ; it is an acquisition never barren, but ever useful and pleasant. Man's superiority over the rest of the animal creation consists chiefly in his greater capacity for acquiring knowledge ; and we see that, among those nations who have made little or no progress in knowledge, so far from man being lord over the brutes, the brutes are lord over man ; and likewise that the happiness of these nations is as scanty as their power. We frequently hear of modern nations being stronger, and more intelligent and happy, than those which preceded them ; and if we examine the cause of this we shall uniformly find that it consists in the comparative ignorance of former nations. The most celebrated of the ancient nations knew little or nothing of Astronomy, Chemistry, Natural History, Natural Philosophy, Geography, Physiology, or Anthropology, and their unhappiness and disunion was in proportion to their ignorance. Thus we may safely adopt the assertion of Socrates, the greatest philosopher of antiquity, when he says "There is only one good thing, which is knowledge, and only one evil thing, which is ignorance."

Having thus decided on the importance of knowledge, the question arises, How are we to set about its acquisition ? Are we to take up the first subject which presents itself, and proceed without rule and without deliberation, as whim or fancy may suggest ? No, certainly not, and for two reasons : 1st. The life of man is short, and his capacity limited ; and 2nd. As it is thus impossible that he can have time or ability for acquiring a knowledge of all that the Creator has placed within his view, it is of the utmost importance that he should direct his attention to the most useful, which, at the same time, will almost always be found to be the most interesting. It is sometimes said that *a man should know everything* ; but there never yet lived the man who knew everything, nor will such a man ever exist. The Creator alone knows everything ; and the more a man knows the nearer he approaches his Creator. The widest range of knowledge which the most talented of the human race can attain is, compared to what remains to be known, as a drop from the ocean.

Knowledge comprehends an acquaintance with every created thing, and its relationships—with our mighty globe, with the whole burden of its people and its countries, with the stars, eighty millions in number, each of them a sun, with its retinue of planets, to which our globe is but a grain of sand on the field of immensity; and, again, with all that the microscope reveals, which shews us that in the leaves of every forest, in the flowers of every garden, and in the waters of every rivulet, there are worlds teeming with life, and numberless as are the glories of the firmament. The imagination is absolutely baffled with the mere attempt to picture to our minds the vast, the numberless tribes which every blade, nay atom, may harbour within itself, and man is again glad to seek refuge in his own insignificance.*

It now becomes evident that some method must be pursued; and accordingly, in order to facilitate its acquisition, knowledge has been divided into separate branches, each of these branches being called a science. For instance, there is the science of the heavenly bodies, called Astronomy; the science of the productions of our globe, called Natural History; and this, again, has been divided into three other sciences: the science of minerals, or Mineralogy; the science of vegetables, or Botany; and the science of animals, or Zoology.

In determining the relative value of these sciences, Phrenology is of great utility. The phrenologist knows that the higher and more anterior an organ is situated in the head, the more superior is its manifestation. Well, then, we have only to determine what organs are necessary for any pursuit to estimate its importance. For observing objects, we know that Individuality is the principal organ necessary. Mineralogy consists chiefly in the observation of inanimate, lifeless objects; thus we know the organ necessary for its cultivation. Botany, again, consists very much in the observation of inanimate objects, and thus the same organ is principally necessary here too. But then vegetables grow and reproduce, and the corolla opens and shuts; and thus the organ of Eventuality, which is situated *above* Individuality, and which takes cognizance of actions as well as objects, is slightly called into play. Hence Botany is a higher study than Mineralogy; but Zoology is highest of all, for here, not only is Individuality required, as in the other two, but Eventuality, too, is called into full activity; and also an organ yet higher than this, which has yet received no name: a short account of it will be found in the last

* The reader will find this subject beautifully dilated on in Chalmers's *Lectures on Astronomy*.

number of *The Analyst*, p. 345. Without Phrenology the same conclusion might be arrived at, *but it could not be demonstrated*, and thus it would always be open to dispute. A vegetable, we may say, is higher in the scale of created beings than a stone : the vegetable grows and produces other beings similar to itself, neither of which operations is the stone capable of. Thus Botany is a more interesting study than Mineralogy ; but Zoology is yet more interesting, for animals not only grow and reproduce, but they also move, and think, and act in concert, some roving through the forests, others hunting in packs ; some sailing through the trackless air, and others in safety ploughing the pathless ocean.

But Zoology being so very extensive a subject that any one department might engage a man during his whole life, it becomes evident that we must restrict our attention still more. Having fixed on Zoology as the most interesting subject within our grasp, what part of animals shall we investigate ? Shall we study the bones, constituting the science of Osteology ? or the heart, called the science of Cardiology ? or the general structure, forming the science of Anatomy ? All these are interesting and useful ; and thus, at the very outset, we are situated like Bees in a garden of sweet flowers, each holding out greater attractions to the industrious little honey-collectors than those around.

There is one consideration, however, which will enable us to make a profitable choice. The thought has probably already occurred, that if knowledge is such a very interesting and useful thing, what knowledge can be more interesting and useful than that concerning the instrument by which we obtain knowledge ? What is this instrument ? It is the mind, and the science of the mind is called Phrenology, the most interesting and important subject that can engage the attention of man.

We thus see how the importance of a subject may be traced step by step ; and I have given this specimen to put educators in the way of estimating the utility of the various subjects they may wish to bring under the attention of their pupils. This is a process not at all understood. Some say, as I have before stated, that *every thing* should be learnt, but those who speak thus must either entertain a very exaggerated idea of the capacity of man, or else a very contracted idea of the extent of knowledge. When the propriety of teaching such and such a subject is called in question, nothing is commoner than to hear that the *whole circle* should be taken in. What does this expression mean ? Is all knowledge intended by the "whole cir-

cle?" or is it intended to convey an intimation that an outline or general idea of every subject should be possessed? If the former is intended, the idea is absurd; if the latter, it is very good, but can afford no plea for putting one subject of comparative insignificance in a prominent place, to the exclusion of one of importance.

Man is ever apt to branch into extremes. Formerly it was the plan to teach only *one* subject, and those who came after, seeing the absurdity of this, declaimed on the necessity of knowing every thing. But if asked for a definition of this every thing, the supporters of this scheme would probably be very much puzzled. No phrenologist would hold such a doctrine. I shall quote some excellent remarks on this subject by an able phrenologist. "As man cannot cultivate all his powers equally, it is surely better that he should cultivate those which he can turn to some account, than, by unavailing efforts, endeavour to excel in something for which he was never designed by nature. How ridiculous it would be for an individual paralytic in the lower limbs to choose the profession of dancing! But would it not be equally absurd for an individual destitute of musical talent to follow Music as a profession? or an individual who could not discriminate colours, to wed himself to the profession of Painting? When talent is naturally weak, it may, by cultivation, be rendered stronger, but no education can compensate for natural deficiencies; and hence, when any power of the mind is very weak, the cultivation of the power will never lead to any satisfactory result, and time will be lost in the effort, which might have been beneficially employed in training some of the other powers more susceptible of improvement. As no human being can excel in every thing, why should not every one confine his attention to that department of art or science most congenial to his nature? But how are we to discover the talents or genius of the individual? In two ways: 1st. In observing the natural bias or inclination of the individual; and 2nd. By following the light which Phrenology throws so broadly and steadily upon the subject." This is all sound and judicious. In another part of the *Philosophy of Phrenology* we find the following passage:—"It must be admitted that the majority of mankind are possessed of *partial* talent. A man who can excel equally in every department of art and science does not exist. His existence is a physical impossibility. But, even admitting the possibility of the case, a question arises whether it would be more *prudent* to cultivate one or a few of these powers to the degree of which they are susceptible, or to attempt to cultivate all the powers, and attain only a mediocrity in each. Had Paganini, for example,

attempted to excel in Mathematics, Metaphysics, Poetry, Painting, Languages, &c., as well as in Music, would he have stood as pre-eminent above his compeers? He probably would not have been known beyond his native city of Genoa. The powers of man are limited, and it is better that he should do little, and *that* well, than that he should attempt to do much, and do nothing successfully. Now is it a matter of little moment that Phrenology should be able to point out what powers of the mind are capable of the most successful cultivation in any individual? Is it nothing that whole years of unavailing efforts should be saved? that the child, from his earliest infancy, should be directed into the path in which his own happiness is to be found, and in which he can most successfully promote the happiness of others? Nobody will doubt that, if Phrenology can lead to this end, it is capable of effecting much good; and every one acquainted with Phrenology also knows that the talents of any individual can easily be recognised, and their relative powers, consequently, easily calculated."

Having thus clearly established that the kind of knowledge placed before each should be in accordance with his natural talents, it only remains to be considered by the teacher what subject or subjects, out of the numberless departments which present themselves, should be studied by his pupils. Thus, if a pupil has large Individuality, Eventuality, and Causality, he will have a talent for the natural sciences, and the teacher, knowing this, has only to make the best choice. Phrenology we have already found to be the most important branch of knowledge that can engage human attention: "The proper study of mankind is man." Next in importance we may mention Anatomy, some knowledge of which is as indispensable as Phrenology to the preservation of health. To use the words of Mr. Combe, "It may be imagined that rules for the preservation of health may be taught without Anatomy being studied; but all such instruction is empirical. The rule resides rather in the memory than in the understanding; and the possessor has no power of modifying his conduct and adapting it judiciously to new circumstances. When a good description of the respiratory organs has been given to a young woman she understands much better, feels more deeply, and remembers much longer and more clearly, the dangerous consequences of exposing the throat and breast to a stream of cold air or to a sudden change of temperature, than if she has only *heard* or *read precepts* to avoid these and similar errors." This seems very obvious, and yet how seldom is it acted on! The mother or teacher is too apt to rely on mere precept, and

their hope, being thus based on the sand, is as unstable as the house of the "foolish man." Pestalozzi well remarks, "It will be indispensable to convince many a fond mother that what was well meant is not always well done, and strongly to impress upon her mind the fact that, by a mode of proceeding flowing from the most benevolent motives, but which would not have stood the test of matured judgment, she may entail on her children all that misery against which it was her only wish to protect them."

If we continue our examination into the more important departments of knowledge, we shall find that, next to Phrenology and Anatomy, which make us acquainted with the mental and bodily constitution of man, Physiology, Medicine, Zoology, Geography, Geology, Chemistry, and Astronomy, hold out seductions tempting, nay irresistible, to the pupil. But instead of entering on these noble subjects of investigation, the teacher, with a strange perversity and blindness, persists in directing, or misdirecting, his chief energies to the development of the organ of Language, which is at the base of the brain, and the lowest of all the intellectual faculties. Disregarding the subordinate place the Creator has thus assigned it, man persists in raising it into the highest. Verily he has his reward!

Language does not constitute knowledge: it is mere learning. A person may know the various names a Horse has received in various languages, and yet have no knowledge of the Horse; and, again, he may not know any of these names, yet if he possesses an acquaintance with the natural history, the structure, the qualities, and the uses of the animal, then he will have acquired some very interesting knowledge. Again, Arithmetic is not knowledge; a person may know that 2 and 2 make 4, and even be a Bidder in Arithmetic, and yet he may not have acquired any knowledge. But if, by the learning he has acquired, he calculates that our globe is nearly eight thousand feet in diameter, then he has acquired an item of knowledge. Thus we see that learning and knowledge are very distinct, and that learning is barren and useless in itself, and only useful in so far as it enables us to acquire knowledge. Hence we perceive the truth of the maxim that a very learned man may be a very ignorant man.

But, overlooking this distinction, teachers continue to ply their pupils with learning, as if it were knowledge itself, instead of, as is really the case, only a ladder to knowledge, and often an useless one, too; for the latter, in nine cases out of ten, can be arrived at without the former. Thus, Greek and Latin are totally useless as a means of acquiring knowledge, and for two reasons: 1st. The Greeks and Ro-

mans had very little knowledge to communicate; and 2nd. That little has already been translated into the British language. Little or nothing was known of the mind, of the body, of the stars, of the healing art, of Natural History, of Astronomy, of Geography, of Geology, of Chemistry, of Government, till the appearance of Gall, Hahnemann, Linnæus, Galileo, Columbus, Lyell, Davy, Bentham—all moderns; and yet teachers, with a perversity unparalleled, perhaps, in the annals of mankind, continue to toil in the same barren path, without a single rational reason to warrant so strange a procedure! I have actually known a teacher put a Greek grammar into the hands of a pupil, in play-hours, who was reading a work on Natural History; and when questioned why he did so, gravely answered "The proper study of mankind is man!" *Very learned, but not the less ignorant for that!* And thus it is that mere language has acquired a repute above real solid acquirements in knowledge. Phrenology will, however, dissipate this, like most other errors: this science shows us why great linguists are, as Dr. Macnish remarks, generally great blockheads. An American phrenologist says, "When the doctrines of Phrenology come to be generally understood, the admiration excited by the possession of a great number of dead and foreign languages will be much diminished. It will then be considered merely as evidence of a large organ of Language, and as no evidence of superior general talents." It is owing to the disproportionate attention that is paid to the education of this organ that *style* is generally placed above *matter*; and I have actually heard it maintained that if the style was good the matter or ideas cannot be bad! It must appear obvious, however, I should think, that the worst ideas may be conveyed in the best language, and that the worst language may be employed to convey the best ideas. It is said that the Greek in which some parts of the New Testament are written is almost barbarous, yet every one knows what the ideas are; and, again, the most poisonous and dangerous ideas have constantly been couched in the most sublime and eloquent language. Bentham seems to have been aware of the propensity of the shallow-minded (phrenologically speaking, those with small Causality) to be taken in by style; for he says he has written one of his treatises to "teach the reader to distinguish between showy language and sound sense." And in the course of this treatise, speaking of Blackstone's *Commentaries*, he remarks, "Correct, elegant, unembarrassed, ornamented, the *style* is such as could scarce fail to recommend a work still more vicious, in point of *matter*, to the multitude of readers."

One great error in which parents wreck many a fond hope unconsciously, is their idea that they have only to procure teachers who know the subject that is to be taught ; and so rooted is this idea that nothing can exterminate it. It hangs like a mill-stone about their necks, and renders futile all their exertions. It is in vain that it is argued, nay demonstrated, that all the learning and knowledge in the world is useless, or worse than useless, if the teacher has not the tact for teaching, which is only possessed by those with a particular organization, and which, as Mr. Wood, of Edinburgh, truly remarks, no experience can give. It is in vain, also, that it is urged that Pestalozzi himself declares some of his most successful teachers to have been those who knew nothing of the subject they intended to teach, and that Jacotot says the same thing, and that common sense says the same thing ; the original idea clings like a leech, and the consequences we all know.

There is a village schoolmaster in my neighbourhood who knows as much or more than he will ever have occasion to communicate to his pupils, and yet it all lies useless in his own brain, because he has not the tact to communicate it. He has not, during many years, got beyond teaching his pupils to read ! I have heard some of them read at various times, and they did not read as if they understood the subject ; I accordingly questioned them. One boy came to the passage in the New Testament, "wearing a crown of thorns." I asked him what "wearing" meant : he did not know. A girl came to the expression "dissolved :" she did not understand the meaning. I asked her what a lump of sugar became when put into tea. Her eyes, before expressionless, now brightened up ; the meaning, which was before dark, now dawned on her. In this way I cleared up the various unintelligible words ; and the business thus became as delightful as it must before have been irksome. Reading and writing are not knowledge, but mere learning, and they only exercise the organ of Form ; but if knowledge can be mingled with the learning, it is like causing the desert to blossom as the Rose. A valuable precept of Locke is entirely disregarded. He remarks, "But, under whose care soever a child is put to be taught, this is certain, *it should be one who thinks Latin and languages the least part of education.*" And after this he proceeds to shew how Latin or other languages may be taught, as he has known from personal experience, by one who is unacquainted with them. Let a teacher have the *manner*, and the matter cannot fail to follow ; but parents, in their anxiety for the latter, lose all.

With regard to Logic, it is usually attempted to be imparted in even a worse manner than Greek and Latin. It is often taught by those who have small "Causality" and "Insight into Human Nature," and the attempt is, of course, futile. I would recommend all those who have been engaged in this department to peruse the *Testimonials* published by Combe, in which the various eminent writers concur that no sound system of Logic can be taught without Phrenology. One writer says, "Convinced as I have been that Phrenology is the true philosophy of mind, I cannot but regard it, not only as conducive to the successful teaching of a Logic class, *but as the only foundation on which sound Logic can be reared.*" How many there are, alas ! who will be obliged to express the same sentiments as another writer—"An old student myself in the Logic class, I can never look back *but with regret on the barren path* I then found myself obliged to tread."

Nor is it possible to teach language as it should be taught without an intimate acquaintance with Phrenology ; and yet how many there are who undertake this without even knowing the names or the number of the primitive faculties of the human mind ! It is ignorance like this, conjoined with an unfavourable development, that prompts to their insane mode of proceeding, a mode equally unsound whether we regard the manner or the matter. It would hardly be believed, but I can vouch for the fact, that one-half of the time devoted to language is not unfrequently expended on—*grammar* ! I shall cite the opinion of Lord Kames on this point. "In teaching a language it is the universal rule to begin with grammar, and to do everything by rule. I affirm this to be a most preposterous method. *Grammar is contrived for men, not for children.* Its natural place is between language and logic ; it ought to close the lectures on the former, and to be the first lectures on the latter. *It is a gross deception that a language cannot be taught without rules.* A boy who is forced into grammar rules makes a shift to apply them [from rather extensive observation, I should rather doubt whether even this was the case] ; but he applies them by rote, like a Parrot. Boys, for the knowledge they acquire of a language, are not indebted to dry rules, but to practice and observation. To this day I never think without shuddering of Despauter's grammar, which was my daily persecution during the most important period of life. Curiosity, when I was further advanced in years, prompted me to look at a book that had given me so much trouble. At this time I understood the rules per-

fectly, and was astonished that formerly they had been to us *words without meaning*, which I had been taught to apply mechanically, without knowing how or why."

This passage is admirably true, and had it been adopted by teachers as such, the pupil might then have had a chance of that which, under the present system, is next to impossible—learning a foreign language within a reasonable time, and that, too, with pleasure to teacher and pupil. Locke, Gibbon, and Pestalozzi, have expressed the same idea in language equally forcible; and yet teachers, like Horses in a mill, cannot quit their old round. Truly they are a stiff-necked generation!

From the hasty survey which we have now taken of some of the leading essentials in a sound method of education, two prominent circumstances cannot fail to impress our minds: 1st. That a particular organization is indispensable to a successful teacher; and 2nd. That all education that is not based on Phrenology must be empirical and unsound. Both these facts seem to me self-evident; but, for the sake of those with whom "authority serves for reason," as Locke expresses it, or, phrenologically speaking, whose Veneration is unguided by Causality, I shall quote the words of various writers. The master of the English department of the High School of Glasgow thus expresses himself:—"As education, properly considered, aims at the proper development and regulation of man's nature; as it is, therefore, *absolutely essential to a teacher's success* that he should have a *guide* to the knowledge of that nature; and as Phrenology appears to me not only the plainest but the most satisfactory guide yet discovered; it is my decided opinion that he who teaches and *trains* upon phrenological principles will experience a constantly increasing attachment to his profession, will invariably secure the affectionate esteem of his pupils, and will, as a necessary consequence, succeed in giving them a thorough EDUCATION, moral, intellectual, and physical. I write this not in a theorizing spirit, but *from several years experience*. * * In History the use of Phrenology is truly valuable. In fact, till I knew something of this beautiful system of mental philosophy, *I never taught History properly, or, I may add, anything else*." This testimonial is truly valuable, and completely conclusive, coming as it does from a teacher of long standing. He had a fit organization for teaching, and only wanted the guide which was furnished by Phrenology. But to others, as I have before mentioned, Phrenology would be of no service. The telescope is necessary to enable the astronomer to prosecute his studies, but the telescope would be of no service to the blind

man ; and in the same relation Phrenology stands to those whose organization is unfit for the office of teacher.

Phrenology will, doubtless, soon be considered by society at large as indispensable to the teacher as it is at present by the thinking few. The science has hitherto, however, been regarded too much in the light of a means of predicting character ; that is, the inferior branch called Organology has been confounded with the science of Phrenology properly so called. This has been owing to the general preponderance of the perceptive or lower intellectual faculties over the reflective or higher intellectual faculties. The former should be left to professed organologists, as Deville ; while those who wish to soar into the higher departments should follow in the steps of the phrenologists, as Gall, Combe, and Vimont.

Mr. Robert Chambers remarks, "I have reason to know that, with or without the Organology, the science of Phrenology is making rapid progress amongst the more thinking portion of the middle and lower ranks. Its progress would, in my opinion, have been much greater if its pretensions as a means of discovering character from external signs (Organology) had not been ignorantly confounded with those of the false sciences of the middle ages. Were the metaphysics presented alone, this obstacle would be, in a great measure, overcome, and multitudes who have hitherto regarded the science as only a new kind of divination or palmistry, would be astonished to view a system calculated to throw the united labours of Aristotle, Locke, Reid, and Stewart, into the shade ; an almost exact reflection of human nature, a code of sublime morality, a means of accelerating to an unprecedented degree the social progress of our race." Alluding to the different candidates for the logic chair, the same author remarks, with equal truth and sound sense, "Indeed, were it not that many of the most enlightened men are still ignorant of the merits of the new system, the filling of the present vacancy with one who persists in describing the mind as consisting of memory, judgment, and imagination, would appear to me as a solecism not less great than would the appointment to the chair of Chemistry of one who continued to describe fire, earth, water, and air, as the elements of matter."

Towards dispelling the gross ignorance which prevails on the subject of the mind, no work will operate more effectually than Gall's unequalled *Fonctions du Cerveau*, which Dr. Elliotson pronounces to be worth all the other phrenological works put together. Next to this may be ranked Combe's *System of Phrenology*, of which Dr. Macnish thus speaks :—"Great light has been thrown on this

science by Mr. Combe. His *System of Phrenology* is a beautiful exposition of the phenomena of mind, and constitutes, in my humble opinion, by far the best system of mental philosophy in the English language." Another work which I may mention is the *Constitution of Man*, a work which, next to the New Testament, I would recommend to every one's perusal. Dr. Macnish continues thus:—"His volume on the *Constitution of Man* is a performance of an equally high order of intellect, and may be justly considered one of the most remarkable productions of the present day. Few works have met with such a circulation; and when we consider its extraordinary merits, this fact is no way wonderful." The *Anthropological Magazine* is a periodical that should be possessed by every one in the island.

If the time or opportunities of any one, but especially of any one connected with teaching, are limited, the works which might be studied with most advantage are Macnish's *Introduction to Phrenology*, and Combe's *Constitution of Man*. These two works, to a reflecting mind, will furnish all that is necessary to frame a complete and successful system of education. And if teachers could be persuaded to take these for their guide, they would be astonished at the entire and radical change which would take place in their whole manner of thinking, and the different light in which they would view the actions of their pupils. Dr. Elliotson has, in a few words, summed up some of the advantages which Phrenology will confer on the human race. "None but those," says he, "who are totally ignorant of Phrenology regard it as a means of merely discovering natural powers and dispositions by external signs. Those who have studied it know, indeed, that the natural powers and dispositions are, *cæteris paribus*, in conformity with the size of the various parts of the brain; but they know likewise that Phrenology unfolds the only satisfactory account of the mind, human and brute; that it contributes to establish the surest foundation for legislation, education, and morals, and presents a large department of nature in the noblest, grandest, and the only satisfactory point of view; and that those who reject or neglect Phrenology are lamentably ignorant of much which they fancy they know, and deprive themselves not only of much intellectual delight, but of much practical utility, and, compared with phrenologists, remain as men of some centuries past."

Man has all the capacities for reaching the topmost pinnacles of knowledge, and fathoming its inmost depths; consequently, he possesses the fountains of happiness and enjoyment: and yet he remains ignorant, and, therefore, unhappy. Why does he not put

forth his faculties to their full extent, and treasure up the golden hoards of knowledge which have been placed within his reach by his Creator? Because he has not clear ideas of his own mental constitution; in other words, because he is ignorant of Phrenology. Man will never attain that full enjoyment of which he is capable till he acquires complete and correct ideas of his own constitution; and till then he may rest assured he will remain in his present wretched state.

How, then, should we hail any science that promises to elevate mankind from their present condition; a science which will bring the blessings of civilisation not only to Britain but to the whole world; which, with powers scarcely less miraculous than those of Moses' rod, will cause the water to gush forth from the parched understandings of men, and unlock the inmost springs of the mind; which will diffuse light where darkness previously prevailed, and cause kindly feeling to bloom like an evergreen! The sons of Britain answer with one accord, and the whole world echoes the answer, "We should gladly sacrifice everything we possess to gain so noble, so incomparable a blessing; and no obstacle should retard our eager footsteps while pressing forward to secure so inestimable a boon." Phrenology is such a science! It is a sun—human nature the world it illuminates; which nature, wherever existing, and under whatever aspects seen, must feel the benign and quickening influence of its beams.

S. D. W.

CORRESPONDENCE.

TO THE EDITORS OF "THE ANALYST."

GENTLEMEN,

I place at your service the following geological observations, in the hope that they may prove interesting to some of your readers.

The form of a coast, lake, valley, or mountain can often be traced to the former prevalence of earthquakes and volcanoes in regions which have long remained undisturbed. To these convulsions the

fertility and sterility of the soil, land above sea, and various peculiarities may be distinctly referred. On the other hand, we observe present changes slowly taking place in rivers, lakes, and shores. Another example : we find in certain localities a substratum of coals, the remains of vegetables, and as Mr. Lyell justly observes, " the commercial prosperity and numerical strength of a nation may be mainly dependent on the local distribution of fuel determined by that ancient state of things." On taking a general view of the country on the Kentish side of the river Thames, we observe a rich variety of hill and dale, cultivated in a manner calculated to excite the most powerful emotions of the mind in admiring the beauties of Nature. No man can behold the matchless scenery of Kent without feelings of wonder and admiration ; the fertile plain, the barren hill, the sloping plantation of fruit trees : and in spots where Nature parches and withers, we see the ingenuity of man adorns the place with the Raspberry and the Strawberry. The valleys run, there or thereabouts, from east to west—a fact which supports the theory of the earth revolving on its poles ; as the tides would in consequence have a natural tendency to run east and west. Some writers of distinguished talent have gone so far as to contend that the origin of the greater number of existing valleys was simply due to the agency of one cause, and that it was consummated in a brief period of time. But I believe the sinuosity of deep valleys is one among many proofs that they have been shaped out progressively, and not by the simultaneous action of one or many causes. In regard to the transporting power of water, we are often surprised at the facility wherewith streams of a small size, and which descend a high declivity, bear along coarse sand and gravel.

It is impossible to deny that the waters of the sea have formerly and for a long time covered those masses of matter which now constitute our highest hills ; and, further, that these waters for a long time did not support any living bodies, that is in reference to changes which took place in the inorganic rocks. It is also evident that the basin or reservoir containing the sea has undergone some change at least, either in extent or in situation, or both ; such is the result of the very first search and of the most superficial examination.

On penetrating the different parts of this coast, the strata vary considerably in depth, the plastic clay being deepest in the valleys and immediately as the hill ascends. On removing the diluvial crust or debris we come to a layer of sand, which runs from two to eight feet from the surface. This formation contains fresh-water

shells, the *Venus*, *Cytherea*, *Helices*, and *Cardium*, and the remains of existing animals: it is termed the new Pliocene formation or period. Although new in comparison with the others, it is yet of high antiquity in regard to man. The next structure is a bed of plastic clay, varying from one foot to forty feet in thickness. This lies upon another bed of sand, containing the remains of animals, some of which are extinct. These strata clearly demonstrate a deposit after each action of the tide. There is a process going on, or was in operation fourteen years ago, on the levels connected with the river Trent, in Lincolnshire, termed warping: it was accomplished by means of two sluices which conveyed the tide to the upper part of the level. Flood-gates being closed until low water, gave time for a deposit; upon raising up these gates clear water passed off, leaving a coat of earth on the surface of the land. The owners of the property continued this operation from three to six years, according to effects, rendering land which was nearly valueless worth from £55. to £75. per acre, consequently capable of the higher culture. This example tends to illustrate the regular deposits which are observable in all the aqueous formations. I have not only found in this bed portions of the Mammoth or extinct Elephant, the Asiatic Elephant, Rhinoceros, Lion or Tiger, Hyena, Horse, Buffalo or Ox, Elk, Deer, and Boar or *Sus scrofa*, but numerous shells, viz., *Unio*, *Helix*, *Melania*, *Cytherea*, *Cardium*, *Infundibulum*, *Echinulatum*, *Micula*, *Oliva*, *Venus*, &c. This is termed the old Pliocene formation. Dr. Buckland, in remarking on this period in the *Bridgewater Treatise*, vol. i., p. 95, says:—"It appears that at this epoch the whole surface of Europe was densely peopled by various orders of mammalia; that the numbers of the *Herbivora* were maintained in due proportion by the controlling influence of the *Carnivora*, and that the individuals of every species were constructed in a manner fitting each to its own enjoyment of the pleasures of existence, and placing it in due and useful relations to the animal and vegetable kingdoms by which it was surrounded. Every comparative anatomist is familiar with the beautiful examples, mechanical contrivance, and compensations which adapt each existing species of *Herbivora* and *Carnivora* to their own peculiar place and state of life. Such contrivances began not with living species. The geologist demonstrates their prior existence in the extinct forms of the same genera which he discovers beneath the surface of the earth, and he claims for the author of these fossil forms, under which the first types of such mechanism were embodied, the same high attributes of wisdom and goodness,

the demonstration of which exalts and sanctifies the labours of science in her investigations of the organisations of the living world."

Under the old Pliocene formation we come immediately to the chalk, which in this neighbourhood has not been penetrated. The fossil remains which I have been enabled to collect, consist of the following, viz.: *Smocerami*, several species; *Echini*, ditto; *Plagiostoma*, *Spinosa*, *Serpula*, *Dianchora*, *Pecten*, *Terebratula*, *Ventriculite*, *Pentagonaster* (one of which I possess, the five sides being complete), with numerous ossiculi, and fishes and reptiles' teeth: the fishes teeth belong to the *Squalus* tribe. In some parts of the plastic clay is occasionally found a thin bed of chalk, deposited between the new and old pliocene formations. Immediately on the bank of the Thames there is a dark-coloured bed of plastic clay, lying over a stratum of six feet thick, containing an immense quantity of vegetable matter, principally the remains of the Yew tree, sufficient to answer the purpose of fuel, if treated after the manner of making peat. The greater number of shells, both in the fresh-water and marine formations of this tertiary series, are so nearly allied to the present genera that we may conclude the animals by which they were formed to have discharged similar functions in the economy of Nature, and to have been endowed with the same capacities of enjoyment as the cognate molluscs of living species.

Those geologists who are not averse to presume that the course of Nature has been uniform from the earliest ages, and that causes now in action have produced the former changes of the earth's surface, will consult the ancient strata for instruction in regard to the reproductive effects of tides and currents. It will be enough for them to perceive that great effects now result from the operation of these agents in the inaccessible depths of lakes and seas; and they will then search the ancient lacustrine and marine strata for proofs of analogous effects in times past. Thus we have a collection of facts, a series of epochs anterior to the present time, and of which the successive steps may be ascertained with perfect certainty, although the periods which intervened cannot be determined with any degree of precision. These epochs form so many fixed points, answering as rules for directing our inquiries respecting this ancient chronology of the earth.

J. GRANTHAM.

Crayford, Kent.

TO THE EDITORS OF "THE ANALYST."

GENTLEMEN,

BEING once more in my own quiet room, after a hurried and harassing visit to London, I take the earliest opportunity of writing to you, for the purpose of mentioning certain things and circumstances which afforded to me both satisfaction and improvement.

I left Hull, by the *Water Witch* steamer, for London, July 8th. There were many passengers, some, of course, very commonplace, and others highly-interesting companions. Among the latter *species* may be mentioned two Anglo-African merchants. One of them had resided some years in a colony near the river Gambia, and the other at Fernando river. Our conversation consisted of statements on their part, and questions on mine, on the social, moral, intellectual, and commercial condition of the African aborigines. In connection with the commercial information they gave me, I think the following facts somewhat important. Firstly, that there is a great quantity of gold, in various sized pieces, along the whole line of coast, and which rich metal is only mechanically mixed with the alluvial soil; so that it requires little capital or trouble to collect the ore together. Secondly, that, from this and other sources, a fine prospect is afforded for commercial speculation, particularly as English manufactures are preferred by the natives. Thirdly, that when European settlers are temperate, and not addicted to sensual excesses of any kind, they may enjoy very good health. One of the gentlemen was a man of colour, and the other an Englishman, but both looked extremely well, and very intelligent. They particularly wished for a list of good elementary works on Science, Physiology, &c.; they were also much pleased with Phrenology, and were eager to know something about it. By the way, I found almost every body desirous of obtaining some phrenological information. Truth may be slow in its progress, but nothing can ultimately impede it. Whatever the obstacles or the prejudices which have hitherto retarded the philosophy of Gall and Spurzheim, they will now be crumbled to pieces, and be dissipated like chaff before the wind; because the common sense part of the community begin to recognize the importance of Phrenology for education, for criminal legislation, and for the treatment of the insane.

When in London I called at most of the institutions, and found them in a flourishing state; I also saw many private collections of

Natural History. It would be occupying too much of your space to make particular mention of them, but I cannot resist describing a few of the things I saw. In a shop in the Strand, nearly opposite Chandos-street, there are a number of specimens of copal, with insects; Moths, Spiders, and Ants, are enclosed within this transparent yellow substance, forming a beautiful contrast to the tombs which usually receive the bodies of all things which have lived and moved. Instead of the gloom which generally surrounds the last habitations of animated beings, here was brightness; and instead of being loathsome to look upon, they were something to admire and covet. There was one thing that particularly struck me, namely, that the Moths, Spiders, and Ants, although "quietly inurned" in their present magnificent sepulchres for centuries, retained their forms and *palpableness*, and seem as if they were but the other day doomed to be incarcerated in their present resinous receptacles. How insignificant and bungling seem the vain efforts of man to embalm and preserve the corpse of some departed friend, by saturating it in bitumen, and by folding it in numerous filaments saturated with essential oils, as compared to this manner of preserving animal bodies in a transparent, imperishable, and, when polished, elegant substance! O Nature, thou art profound and perfect, even in what may appear fanciful in thy works!

Whilst detained in the Strand for some models I had ordered, I took the opportunity of visiting the Adelaide Gallery. It was about a quarter before two o'clock, the time when the magnetic and electro-magnetic phenomena are exhibited. A very talented gentleman, whose name I do not know, gave a short lecture on these interesting portions of Natural Philosophy. He showed us the decomposition of water by the electro-magnetic agency, and its recombination by combustion; and also the immense power imparted to the magnet, to sustain very great weights, whilst a galvanic circle was kept circulating round the copper coils which surrounded it; and, lastly, the brilliant experiment of inducing a succession of sparks from a large magnet, proving to the senses that there is an identity between electricity, magnetism, and galvanism. But what is particularly worth your attention is this fact, that I and many other persons took a shock from the large magnet, and remarked that the sensation was most powerful at the elbow joints, where it seemed to terminate. Now when a shock is received from an electrifying machine, whether from a cylinder or plate, it passes through the whole body instantaneously, and the mind is conscious of the phenomena; but this is not the case with the shock from the elec-

tro-magnetic apparatus. It then occurred to me that this phenomenon (the shock from the magnet not being felt beyond the elbow joints) would seem to warrant the supposition that the electric matter differed in degree and intensity according to the media through which it is transmitted.

I am, Gentlemen,

Your obedient servant,

J. L. LEVISON.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

THE ordinary meeting was held on Monday evening, Mr. Stephens, President, in the chair. Mr. Bowerbank exhibited some specimens of cork, which had been greatly injured by a species of *Dermestes*. The vessel in which the cork was brought over to the docks had previously contained a cargo of hoofs, horns, and bones, from which the insects were produced. A great deal of injury had also been done to the mast of the ship, which would have to be replaced; and it was even feared that the vessel itself was destroyed. The insects had already committed very extensive ravages in the localities of Saffron Hill and Whitechapel, where they attacked the posts in all directions, and were also very common in Wapping. Mr. B. suggested, for their destruction, the essential oil of almonds, the vapour of which would probably be effectual.—Mr. Bainbridge exhibited a small species of Moth, which had been very injurious to Apple trees in the neighbourhood of Lambeth; in many cases the leaves were destroyed altogether. The cocoons are formed on the leaves, which soon become covered with webs so strong that, in many cases, the young leaves cannot burst through them; but the larger leaves of Apple trees escape, and Pears are but rarely attacked.—Mr. Westwood detailed an entomological visit lately made to Paris; and, amongst other subjects, he noticed a disease called muscadine, with which Silk-worms have been very extensively attacked in France. The malady, like a parasite, gradually envelopes the whole body in a white fungus, and destroys the worm; the mischief being produced by the explosion of a fungus, which is taken in by the spiracles or pores of the skin, as has been proved by M. Audouin, who has inocu-

lated several worms and beetles with it. There was also a specimen of the *Scolytus pygmaeus*, an insect which attacks the Oak, and which has latterly proved so destructive that 80,000 trees in the Bois de Vincennes have been cut down, in consequence of its attacks. Mr. Westwood, in conclusion, made some remarks on the progress of Entomology in France, which he stated to be in advance of this country, there being more working cultivators there, and the collection at the Jardin des Plantes being superior to that at the British Museum. M. Audouin had just completed a course of fifty lectures on Entomology.

WARWICKSHIRE NATURAL HISTORY AND ARCHÆOLOGICAL SOCIETY.

The council of this Society read their Annual Report to the members on the 23rd of May, 1837, at their first anniversary meeting. This Report is arranged under three general heads, preceded by some necessary preliminary observations. It was considered by the council to be highly important to make the quarterly meetings interesting to the members at large; and, during the past year, they have been fortunate enough to obtain the assistance, on those occasions, of Professor Buckland, of Dr. Lloyd, and of Mr. M. Bloxam, by each of whom a very interesting address has been delivered to a large auditory, with the effect of increasing the number of the friends of the Society. At one of the quarterly meetings, Mr. Sharpe read a paper on a curious archæological subject; but the council regret not having yet been favoured with communications, so much desired by them and so easily furnished by all observant naturalists, relating to the different branches of Natural History.

GEOLOGY AND MINERALOGY.—Considering that the Society's first year has but just concluded, the collection in Geology and Mineralogy has attained a greater extent than could have been anticipated in so short a period; and it is a subject on which the council congratulates the Society, more especially as the far greater proportion consists of contributions from the cabinets of members and others interested in its welfare; the sole purchase which has been made being a series of mountain rocks, all of them illustrative of some part of the Geology of the British Islands, collected by the Rev. Dr. Rowley, late Master of University College, Oxford. The cost of this interesting and well-selected collection was only ten pounds.

Many persons, possessing private collections, are oftentimes prevented from contributing to public museums from not being aware of what things may be desired; and others, not being in the habit of collecting for themselves, and feeling but very little interest in any particular branch of Natural History, having nevertheless many oppor-

tunities, during summer excursions, of acquiring various natural objects, would gladly do so had they but a few directions as to the kind required. To obviate these obstacles and with a view of enabling all who are disposed to add their mite to this department, as well as of offering an incitement to indulge in an agreeable amusement which may grow into a rational pursuit, the council takes a cursory review of the present state of the collection, and in so doing points out those parts of it in which deficiencies are most numerous, at the same time remarking that no part is by any means complete. In the rocks more ancient than the coal formation, and in that division of them called primary, viz., from the Mica Schist to the Clay Slate inclusive, the collection is defective; and visitors to the romantic mountain scenery of North Wales, or the Cumberland and Westmoreland lakes, may have ample opportunities of obtaining examples; but of the series succeeding to the Clay Slate, viz., the Transition, Upper Grauwacke, or, as it is now called, the *Silurian* system, the Society possesses many rare and characteristic animal remains, from the neighbourhood of Ludlow and from the well-known Dudley Limestone. Of the Carboniferous system, they have numerous and choice specimens, particularly of the vegetables belonging to the coal formation itself; but in the animal remains of the Mountain Limestone, which is found in Derbyshire and several other northern counties, in the neighbourhood of Bristol, and in South Wales, the collection is deficient; and almost any fossils, particularly Encrinurites, should, if possible, be obtained. It is well known that organic remains in the New Red Sandstone have but recently been detected in England, and at present none have been found in a good state of preservation, so that every thing should be actively searched out and carefully collected. The Magnesian Limestone, which belongs to this series and is extensively distributed in some of the northern counties, affords many and curious remains; of these, at present they have not one. No part of the collection is so rich as that of the Lias, though it may reasonably be expected that the numerous Limestone quarries in this county will continue to yield new and valuable additions. At present, scarcely any vegetable remains of the Lias of Warwickshire have been detected; and it is greatly to be desired that the attention of those members residing near the quarries should be directed to that part of the subject. Any fossil specimens of the remaining secondary rocks, from the inferior Oolite to the Chalk inclusive, are desired. A similar remark is applicable to the tertiary strata; since, with the exception of a few crag fossils from Norfolk, the collection contains no British organic remains of these strata. A most valuable contribution of tertiary fossils, from Sicily, has been presented by the Marquis of Northampton. The London Clay in Kent, Sussex, and Hampshire swarms with fossils which may be easily obtained. The collection of simple minerals is at present very limited in extent. Of these, there is one which is entirely new. It is a beautifully crystallized Salt of Alumina, and, according to Dr.

Apjohn's analysis, appears to be a sulphate of that earth with Manganese. It was brought from the neighbourhood of the Bushman river, in South Africa. In concluding this part of the Report, the council strongly recommends those members who may in future present rock or fossil specimens (and the recommendation is equally applicable to all branches of Natural History), to pay particular attention to attach the name of the place from whence each specimen may have been derived, to the specimen itself or to the paper envelope. So important is it to attend to this, that it frequently happens that, from inattention to this circumstance, specimens are worse than worthless, as it leads to error and confusion in attempting to arrange them.

ZOOLOGY.—The specimens in Zoology, although daily increasing, are not numerous. This department contains about three hundred birds, of which sixty-eight are foreign. The curators feel extremely anxious to complete and classify the collection of British birds and quadrupeds, in which, it may be observed that many members of the Society have the power materially to assist them. They gratefully acknowledge many presents made to this branch of the museum, and are desirous to allude more particularly to the numerous specimens received from Sir Charles Throckmorton, who has repeatedly contributed to several departments of the collection, but especially to that of birds. Some progress has been made in the formation of a collection of birds' nests and eggs. Few parts of England more abound in all the varieties of song birds than the well-wooded parts of Warwickshire, and with moderate assistance specimens of them all might soon be exhibited in the museum. Specimens of sea birds are very much wished for, and also winter birds. When rare birds are met with, it is desirable that the locality in which they are found should be mentioned. The nests of birds will be rendered more valuable if sent with portions of the branches to which they are attached. In the entomological section a few specimens only are possessed, but this part of the collection is likely soon to be much increased. In certain instances, the nests of the animals belonging to this division are highly worthy of preservation, as may be seen by the specimens of the nest of the Marabunta, the Common Hornet, the Wasp, &c., already in the museum. The collection of shells is deficient; it contains some good specimens. Of quadrupeds and of fishes, very few have yet been received. The number of quadrupeds is only twenty-five, that of fishes is still smaller; but it is hoped that a perfect collection of the fishes of the Avon may soon be made. Of the reptile tribes, some have recently been presented. The council entertain hopes that, as the collection increases, not only will the arrangement of the different specimens in the zoological department be such as to illustrate the leading divisions of Natural History, but that they will become more fitted for the instruction of those who feel interested in comparing the structure of different tribes of living beings. Several skeletons of the smaller quadrupeds and of birds are in the course of preparation, which, added to those now in the cases, and to the col-

lection of skulls of animals and human skulls, and the casts of skulls of the different varieties of the human species, with the specimens of parts of the osseous system of the larger mammalia already in the museum, will soon be sufficient to illustrate the frame-work, or bony structure, of vertebrated animals. The illustration of internal structure is a larger task, and demands larger resources; but no one can doubt that it may be effected, even by a provincial society, when it is remembered that splendid museums of comparative anatomy, and even of Natural History in all its branches, have occasionally been the work of single individuals.

ARCHÆOLOGY.—There is one portion of the collection, apparently devoted to mere curiosities, but which in reality illustrates no less important a subject than the natural history of man; a consideration which gives value and utility to the specimens of the dress and manufactures, the weapons and instruments of chase, of the Islanders of the South Sea, of which specimens several are deposited in the Society's museum. Much of the interest belonging to the archæological department arises from like considerations. The building materials, the costume, the money, the armorial devices of each age, are so many illustrations of man's social progress, and illustrate, scarcely less than purely literary remains, the exercise of his natural endowments, in all varieties of time and circumstance. The head of a Deer implanted in an Ash tree, the nest and eggs found in the centre of an Elm, and the portion of an Elm in which a fragment of Sandstone is imbedded, are, to a certain extent, illustrative of botanical physiology, as well as highly curious in themselves. Specimens of dried plants were, some time ago, presented to the Society by Mr. Leighton and Mr. J. Baly. Opportunities have not occurred of adding to this department, but it is in contemplation to make a collection of the plants of the county. Several books have been presented to the Society, and it is expected that the library will soon be enriched with more works relating to different branches of Natural History, including useful manuals in each department. The council also strenuously recommend the preparation of descriptive catalogues of each portion of the collection, as calculated very greatly to add to the advantages of the Society, as soon as this is found to be practicable.

ASSOCIATION FOR EXPLORING CENTRAL AFRICA.

We have just seen and hastily perused a *Catalogue of the South African Museum, now exhibiting in the Egyptian Hall, Piccadilly*, for objects particularly entitled to the fostering patronage of naturalists, philanthropists, and a patriotic government. This museum contains an extensive collection of new and rare quadrupeds, birds, and reptiles from the interior of Southern Africa, with numerous specimens of the arts and manufactures of the natives, and about four

hundred drawings illustrative of the character of the country and its productions, of the manners, costumes, and social condition, and of the religious ceremonies of the inhabitants.

This valuable and curious collection is the property of a society which exists in South Africa, under the title of "The Cape of Good Hope Association for Exploring Central Africa." It was formed in 1833, by the first party sent into the interior from that Association, soon after its institution. The collection has been sent to England, first for exhibition and then for sale, in the hope that the proceeds will materially add to the very small fund arising from the voluntary contributions of a few colonists, and thereby render it practicable to dispatch in the course of next year a second expedition to resume an exploration of the country at lat. $23^{\circ} 28'$, where the investigations of the first party were discontinued.

Having no view beyond the advancement of knowledge and the benefit of mankind, the Association appeals to the best feelings of a highly-intelligent nation for that degree of support which cannot be expected from a few colonists, however zealous and liberal; and that they have been both the one and the other, is clearly manifested in the fact of their having contributed, in the course of a few months, the sum of nine hundred pounds, exclusively for the encouragement of discovery. With this and the sum of three hundred pounds, which was nobly placed at the Society's disposal by Mr. M'Queen, of Glasgow, so well known for his writings on colonial affairs, the directors of the institution have hitherto been enabled to defray all its expenses.

Although descriptive of a portion of the collection, this catalogue is not intended to offer any details beyond such as it may be reasonably supposed will be both intelligible and interesting to visitors in general: more important and strictly scientific remarks are necessarily reserved for publication in another form. The Association candidly avows a special anxiety to interest the public in its proceedings, as its objects are not likely to be accomplished without a more extended patronage. With a view, therefore, to make known the origin of the Society and its projected enterprise, with the steps already taken for accomplishing the latter, a series of extracts from the Records of the Association are prefixed to the Catalogue, by way of introduction. Among others passed by a general meeting held at Cape Town on the 19th of May, 1836, Sir John Herschell in the chair, is the following resolution:—"That the successful return of the expedition holds out so favourable a prospect of future discovery, that it is expedient that this Association should not be dissolved, but should continue to exist as a permanent institution for the further prosecution of its original object."

Three hundred and thirty-nine zoological articles are specified on the pages of this Catalogue; and of that number forty-seven were first discovered by the expedition, and subsequently described in a separate publication. Among these fruits of the Society's researches

is a new species of the Rhinoceros, with several important additions to the winged tribes ; and as many curious observations on the habits and other characteristics of the more remarkable and rare animals preserved in the Society's collection are concisely introduced into the Catalogue, it is thereby rendered more worthy of public attention and patronage.

Dr. Andrew Smith is preparing for publication a *Journal of the Expedition*, which will comprise a great diversity of valuable information respecting the native inhabitants, the country and its natural productions.

LITERARY AND SCIENTIFIC INSTITUTION OF STAINES.

This Society completed its third season in the month of June last, and the last Lecture was delivered by the Rev. Dr. Jones, Vicar of Bedfont and Vice-President of the Institution, who had already printed five discourses addressed to the same Society, and now sends this one forth to share the fate of its associates. It is a vigorous and animated lecture, sparkling throughout with a brilliant and generous enthusiasm.

During the third season of the Staines Institution, which occupied eight whole months, a lecture was delivered every week, with a few unavoidable interruptions. In the first season eleven lectures only, in the second sixteen were given, but in the last they amounted to thirty-one ; and, says Dr. Jones, who commends them, all these exertions were gratefully acknowledged by a full attendance of the members, by their kind encouragement and warm applause.

Dr. Jones's lecture will be perused with intense satisfaction by all those who cordially engage in undertakings similar to that for the promotion of which he devotes the best energies of an active and vigorous mind. Some of his powers and his principles are manifested in the following observations :—"We certainly live in changeful days ; but it is true philosophy boldly to meet events, and convert them, if possible, into blessings. The general dissemination of knowledge is, perhaps, the most startling of the moral phenomena of our times. Heretofore, influential individuals there have been, anxious and active to forward the cause of popular enlightenment, but they found few of kindred zeal to aid the noble work ; nor was there greater encouragement from the people themselves. A brighter day has dawned upon us. Ignorance has no longer the patronage of high authorities, and knowledge is discovered to be not only the privilege but the happiness of a people. Not that the path is even now so widely opened, or so freed from obstacles, as it soon will be. We have not yet swept away all the little prejudices and fears which retard the march of truth ; still, much has been done, and more benevolently contemplated, and this very contemplation has its use. Nor

is past success without its incentives ; it affords the best basis whereon to rest our hopes of larger and more abundant results. A Christian, and, consequently, a truly benevolent philosophy, carefully contemplates all great and fresh exhibitions of mental power, and moulds them with gentle and plastic adaptation to produce the greatest public good. Aided by such a philosophy, we shall not rudely and insultingly attempt to sully and destroy existing establishments, but rather look for their improvement to the sure, though scarcely perceptible, corrections of time."

Dr. Jones's pages overflow with excellent and instructive precepts, expressed with peculiar and attractive fluency. The following extract compels us to view his objects with respect, and his endeavours with admiration. "Ignorance has had its day," he observes, "and it has failed: the alternative problem is now in progress of solution. The experiment is on its trial, how far literary and scientific knowledge will avail in raising the character of a people, and influencing the destinies of a great kingdom. Say what we will, and do what we please, the impetus cannot be stopped or impeded. We can no more arrest its march by our narrow fears and impotent cavils, that we can roll back the flowing tide of the sea with the palms of our hands. If this be so, what should be our aim? Why, never to decry or oppose the pursuit of human knowledge when this is not made an antagonist principle to our faith as Christians, to our duties as subjects and citizens. On the contrary, let us resolve to diffuse the blessings of useful knowledge and to advocate its cause, not timidly or partially, but strenuously, unsparingly, and conjointly. Faith and knowledge must not be considered rivals, under whose banners enemies are to be enlisted; as representing an antipathy between the two revelations of God, the written revelation of his holy word, and the unwritten page of Nature—between the precepts of the Bible, and the great truths which the science of social economy is hourly eliciting. The gospel of salvation and human knowledge must be joint, as they are confessedly gigantic, levers in the moral and mental amelioration of mankind. Let us, then, give the Bible with our right hand, and the volume of man's wisdom with our left. Let us persevere with the liberal views and cordial tempers which have hitherto guided our councils and rewarded our zeal, and yet fuller as well as riper harvests will follow. And, above all, let us be determined, in spite of every difficulty and trial, to *keep the unity of the spirit in the bond of peace.*"

As a "rural philosopher," Dr. Jones admits that a magazine, cleverly conducted, cheap in price, and mainly confined to reports of the formation and transactions of provincial societies, could not fail of being widely and influentially useful. We entertain the same opinion to its fullest extent, and we shall continue to hold, as we have always done, the pages of *The Analyst* open for the reception and recommendation of reports from such institutions, when guided by the principles which have obtained the Vicar of Bedfont's most eloquent and

irresistible advocacy. We also join most cordially in the sentiments of Dr. Jones when he says "I want literature and science to penetrate into dark, unchronicled, unexplored spots. I want to see the great work of mental illumination active and encouraged through the length and breadth of the land. What though the tree of human knowledge does not yield pure or perfect fruit, we are not to abandon its cultivation, and content ourselves with the weeds of ignorance. Let us rather aim to graft it upon the tree of life, that thus, budding on an immortal stock, it may gladden our earthly sojourn, and nurture us, with the Divine help, for more exalted blessedness hereafter."

CAMPSALL SOCIETY FOR THE ACQUISITION OF KNOWLEDGE.

AMONGST the various and numerous societies whose transactions we have from time to time recorded during the last few years, there is not one whose establishment or success gave us such sincere pleasure as did that of the institution now for the first time introduced to our readers and the public. All tend either to the advancement or the diffusion of knowledge (we will not say of "*useful* knowledge," for what knowledge is not useful?), and therefore all have our hearty good wishes and our feeble support. But the Society of which we have just given the title is established for the benefit and improvement of the *labouring classes*. It were impossible to give more than an outline of its plan and objects, but these are so novel and important that, in the sincere hope of promoting the establishment of similar institutions in other parts of the country, we will present a brief account of what it has already effected.

The members are either ordinary or honorary; the former pay 1d. per week, the latter 7s. 6d. a year, or a composition fee of £1., all payable in advance. The ordinary members consist of labourers, artizans, farmers, &c., the honorary of such gentlemen as choose to join the Society with the view of promoting its objects by delivering lectures, &c. The members are already upwards of forty in number. The following are the names of the honorary members:—Charles Thorold Wood, Esq., Willoughby Wood, Esq., Neville Wood, Esq., C. T. Wood, jun., Esq., William Thorold Wood, Esq., G. C. Yarborough, Esq., M. Tasburgh, Esq., Mr. Keyworth, Mr. Gillatt, Mr. Hindle, Mr. Sykes, Master A. T. Wood, Mr. Lankester, Mr. Chiosso, Mr. Porter, Mr. Marschan, Mr. Barnewall. Donations of £1. each have been presented by C. T. Wood, Esq., Willoughby Wood, Esq., Mrs. Wood, and Mr. Lankester.

June 16th.—The first general meeting of the Society took place at 8 o'clock, p.m., Willoughby Wood, Esq., in the chair. The chairman, Mr. Lankester, and Mr. Chiosso, severally delivered very appropriate addresses on the advantages and uses of knowledge, and on

the objects of the Society. Mr. Lankester observed that were he asked which would be most beneficial to Campsall, the discovery of a gold-mine in its neighbourhood, or the establishment of this Society, he should, without hesitation, declare in favour of the latter. He continued, "You have established a society for the acquisition of knowledge, not in this *city*, not in this *town*, but in this *village*, and, so far as I am aware, it is the first society of the kind that has sprung up in so small and secluded a spot." The rules having been proposed, seconded, and passed, the names of the honorary members and committee were read. A vote of thanks was proposed to Charles Thorold Wood, Esq., of Campsall Hall, the founder of the Society, which was warmly responded to, and the meeting adjourned.

June 29th.—The third meeting took place, Mr. Abson, tailor, Campsall, in the chair. Willoughby Wood, Esq., delivered a lecture on Knowledge, introducing, incidentally, some very appropriate observations on wages.

July 5th.—*Fourth Meeting*, C. T. Wood, Esq., in the chair.—Mr. Lankester delivered an extremely interesting discourse on the Steam-engine, Electricity, Botany, Anatomy, and Chemistry, interspersing the lecture with anecdotes and experiments, and illustrating it with diagrams. The lecture appeared to excite considerable interest, and marked attention was paid throughout. At this meeting it was agreed to admit such inhabitants of the neighbouring village of Norton as chose to join the Society as ordinary members; also to take in the *Penny Magazine*, Chambers' *Edinburgh Journal*, and Chambers' *Information for the People*. To these works will probably be added the *Magazine of Domestic Economy*.

July 13th.—*Fifth Meeting*, C. T. Wood, Esq., in the chair. The chairman recounted the heads of the discourse delivered last week, in order to impress it on the minds of the auditors. Mr. Lankester then delivered a lecture on Botany, illustrated by diagrams and specimens of plants. The vegetable tissues, the parts of plants, and the most familiar modes of classifying them, were explained in a popular and interesting manner; though at the same time—however fascinating Botany and vegetable anatomy may be to those accustomed to study them philosophically—it may well be questioned whether the subject is not somewhat dry and unintelligible to an uncultivated mind. We must "give milk to babes;" and, despite the able manner in which the learned lecturer acquitted himself, it cannot be denied that the attention of at least a portion of the audience began to flag long before the conclusion, a circumstance which cannot be too scrupulously guarded against.

July 20th.—*Sixth Meeting*, C. T. Wood, Esq., in the chair. The chairman commenced the business of the evening by calling upon any of the members to rise and give an account of the lecture delivered by Mr. Lankester last week. After a few minutes Mr. Procter, schoolmaster, of Norton, rose, and observed that he had waited in the hope that some one of his boys would have come forward and

complied with the wishes of their respected chairman ; but that, as they were too shy, he would take the task upon himself. He then proceeded to enumerate the heads of the lecture, in a manner which elicited the enthusiastic applause of all present. That an individual who had, perhaps, scarce heard the name of Botany before should be able to give so correct a summary of Mr. L.'s lecture was certainly encouraging, and it proved—what we never doubted—that at least some of the members were fully competent to comprehend the lecture of the preceding week. Mr. Wood then proceeded to give some account of the *Penny Magazine*, reading portions from the first number, and explaining them where necessary or desirable. The chairman's observations on drunkenness were particularly good, and the whole discourse was suited in an admirable manner to the minds of the auditors. The chairman was frequently applauded, and the customary vote of thanks at the conclusion was warmly responded to.

At the seventh and eighth meetings, on the 27th of July and the 2nd of August, familiar lectures were delivered on Phrenology, by Mr. C. T. Wood, jun. The first of these was devoted to a brief outline of the science, the second to a description of the uses and abuses of the various organs, illustrated with drawings and anecdotes. By some the very idea of lecturing on Phrenology to an audience of labourers and farmers may be stigmatized as absurd. But surely it is interesting and useful to every one to be acquainted with the composition and functions of his own mind ! Every one knows that the lower classes take the greatest interest in Anatomy where the opportunity is offered to them ; and he who believes that the study of the philosophy of the mind would prove less fascinating to them than that of the body is himself no philosopher. Suffice it to say that such was the interest excited by the lectures already delivered on Phrenology that it will probably form the subject of many future discourses.

Hitherto the members have met together one evening in each week to hear any lecture that may have been prepared for them, and at each meeting books are distributed amongst the members. Those who have witnessed the large and attentive audiences at these lectures can easily anticipate the immense advantages which must necessarily result from the establishment of similar societies in other parts of the kingdom. To those who oppose the education of the lower classes altogether, as detrimental to the interests of every party, our observations are not addressed. Such individuals are either too ignorant or too bigoted to be worth notice. But the philosophic phrenologist well knows that every man, except an idiot, has the same faculties, that these differ only in relative size and quality ; he knows also that these faculties can be cultivated to equal advantage, and with equal pleasure, by individuals of all ranks in life, and he acts accordingly.

We can only hope that the Campsall Society for the Acquisition of Knowledge will continue to exert the same zeal which has hitherto actuated it, and that the influential inhabitants of other vil-

lages will follow the example of those of Campsall and its vicinity. Extend this plan to England, Europe, and the world, and then indeed we might, at no distant period, hope to see that glorious consummation spoken of in Holy Writ, "*Knowledge shall cover the earth, even as the waters cover the sea.*"

We shall take an early opportunity of giving a further account of the proceedings of this institution, and in the interim wish it the success it so well merits.

It may be observed, in conclusion, that custom appears to have reconciled all parties to the Mechanics' Institutions for the benefit of the inhabitants of towns. That the same feeling may ere long occupy our minds with regard to societies for the instruction of the now benighted dwellers in villages and the country generally, is our sincere wish.*

CRITICAL NOTICES OF NEW PUBLICATIONS.

The Spas of Germany. By A. B. Granville, M.D., F.R.S. 2 vols. 8vo., pp. lxiii., 946; with Tables and thirty-eight Plates. London: Colburn. 1837.

EVER since the time when disease began to make encroachments on the office of old age, in continuing the natural vicissitudes of human existence, the prolific ingenuity of man has never ceased to be exercised in discovering and devising means for the conservation or recovery of health with its universally desired accompaniments—happiness and longevity. Among the multitude of resources usually employed for attaining these highest of enjoyments, not the least efficacious has long been the use of mineral waters under their saline, chalybeate, and gasiferous kinds, and at all their practicable diversities of application and temperature.

Mineral springs are abundantly distributed over the various regions of the globe, and more than two thousand of them are frequented by invalids and convalescents in quest of benefit from their medicinal virtues. Dr. Granville's volumes are occupied with observations on thirty-six of the German watering-places; and his account of these is both entertaining and instructive.

Having explained the general objects of his work in a concise preface, the Doctor gives a comprehensive introduction, which con-

* The readers of *The Analyst* are indebted solely to Neville Wood, Esq., for this communication.—ED.

sists of "Popular Considerations on the Use and Power of Mineral Waters," and his considerations are arranged under distinct heads. Under one of these he endeavours to expose the prevailing ignorance of the "most influential medical men in London" respecting the nature and use of foreign mineral waters. His evidence in support of this simple proposition is not distinguished by anything new, either in kind or quality: it is based on two cases and repeated examples; and, all these being facts, the proof is a demonstration. Dr. G. next evinces most clearly that the foreign mineral waters are endowed with remarkable efficacy and power; but it is not a part of his plan to show that the British mineral springs are equally powerful as the German; and that some of them, by the same plea, are greatly more efficacious. When treating of temperature, the Doctor concludes that the heat of mineral springs would seem to be *specific* in its action, and therefore dissimilar from ordinary heat: but whence this peculiar heat is derived, he says, no philosopher has as yet satisfactorily explained. By some inadvertency, however, he omits mentioning the process by which he ascertained that the results whereon he grounds his seeming conclusion were produced by the "thermal or telluric heat" exclusively, and not by the gaseous or mineral elements held in combination by the thermal water. Nevertheless, there are creditable reasons for imagining that there may really be different kinds of heat; for, in his "Popular Considerations," Dr. Granville makes it plain that an excess of "thermal caloricity" may be communicated to a frigid looker through the history of inductive sciences, for a key to unriddle the great mystery of permanent heat in mineral springs. His next section unfolds the Doctor's views on the mode in which the mineral waters act, and how they ought to be employed. It is his decided opinion that these waters, when acting successfully on the human system, act as *alteratives*: and whether they do so by changing the character and composition of the fluids of the human body, or by effecting an *alteration* in the solids, it is not less true that it is only as *alteratives* they have been acting. This discovery will be hailed with grateful admiration by the most influential medical men in London, and by the members of that society which, in England, is looked upon as the *ne plus ultra* of scientific academies. The manner in which mineral waters should be used, so as to obtain their alterative effects, is various. The Doctor says they may be taken internally, or they may be used externally as baths. He propounds an ingenious theory on the origin of mineral springs and the antiquity of mud-baths. Mud mineralizes the springs; and although the application of the mineralizing mud of a spring be itself unknown in this country, and is of comparatively recent introduction at the Spas of Germany, yet the use of mud-baths in disease is of great antiquity. In one of the Gospels, the Doctor finds evidence of the practice of using mud-baths having existed in scriptural times, for the cure of the "impotent folk, the blind, the halt, and the withered" or paralytic. He adds in illustration that "the angel who went

down at a certain season into the pool to trouble the water" before the sick could enter it, is evidently figurative of the periodical or occasional muddy condition of the pool of Bethesda, produced by the town-physician making the waters turbid, and thus putting them into the best state for medicinal and sanative purposes. Dr. G. proceeds to repeat the "popular considerations"—that the journey to the Spas of Germany, change of air, difference in the former mode of living, release from laborious occupation, leaving behind of every worry and anxiety of mind, gaiety of the spas, and the constant amusement to be found there amidst agreeable society, all act as auxiliaries to the power and virtues of mineral waters. He grants, with great candour, that these auxiliaries act as *adjuvants* in the cure, but never as principal agents; that they serve to hasten the recovery and render the treatment more pleasant; and that in many cases they seem to be essential to the development of the power (not of the effects) of the water. Dr. G. concludes, from a perfect and impregnable induction, that the difference between an English and a German spa is very considerable, and that the balance is greatly in favour of the latter: and by the same induction the Doctor imposes an immense debt of gratitude on the English people for the sagacity and eloquence with which he endeavours to persuade them that the Spas of Germany are fraught with benefits every way unparagoned.

Dr. Granville's method of defining the special objects in using mineral waters is very philosophical. If it be true, he says, that mineral waters possess great medicinal powers, their use must presuppose a *serious* purpose, which purpose is either to cure a present disease, or to mitigate it, or to prevent a threatening one; and therefore he infers that most individuals use the waters as a *means of cure*. Experience has enabled him to disclose the information that, in curing, mitigating, or preventing disease, we have often need of more than one mode of action on the part of the agent employed for those purposes. We require, he says, either a purely restorative or a purely corrective agent, or both modes (he means agents) may be necessary at one and the same time, either in equal or in differently proportioned degrees of such agents. Hence he has ascertained that three classes of mineral waters may be established at once, founded upon these three modes of action, which shall meet every case likely to present itself at a mineral spring; and that between the four ends of Germany there are spas endowed with the qualities we have need of for furnishing the three required modes of action. The Doctor concludes this instructive branch of his "Popular Considerations" with the pleasant intelligence that, in Germany, the people enjoy as good health as in this country, and do not die in larger numbers under ordinary circumstances.

"Rules for the Use of Mineral Waters, Regimen, and Diet" involve topics of vital importance to those individuals who frequent the Spas of Germany, where the dinners are delightful and the society is exquisite. Dr. G.'s "Rules" are extremely judicious, and

agreeably distinguished by his characteristic originality, conciseness, and precision. Experience and contemplation led him to the discovery that "a moderately-nourishing and easily-digested dinner suits all patients." As a finisher to the "Popular Considerations," their inditer pours forth a pathetic effusion, by way of illustrating the vivacity of his patriotism and the disinterestedness of his philanthropy. "In conclusion," he observes, "I would say to such as are able and willing to try the effect of some one of the German Spas, in hopes of casting off any disease under which they may have laboured at home with little hope of recovery,—haste away, and make the trial by any means. Do not waste your life and your purse in swallowing endless drugs, and ringing the changes of remedies and doctors, pent up in a hot house in London during the summer months, or in being lifted in and out of the carriage, the prey of some chronic and insidious disorder, which baffles your vigilant physician's skill; or in being sent from Brighton to Tunbridge, and from thence to Leamington or Cheltenham, merely to return again to Brighton or London exactly as you left it, having in the mean time tried as many doctors as places to no purpose. Fly, I say, from all these evils, proceed to some spring of health, and commit yourself for once to the hands of Nature—medicated Nature—assisted" [by the "physician of the place," and] "by every auxiliary which an excursion to a German spa brings into play; and depend upon it that either at the first, or at the second, or third," or some other occasion of "visiting and using such spa you will have reason to rejoice that you exchanged Art for Nature."

Dr. G. believes that there does not exist, in any language, "a work presenting the narrative of a grand tour to the most celebrated and fashionable *mineral watering-places* of Germany in regular succession; a tour in which amusement is blended with information, and descriptive sketches of the humours and fancies of each spa are mixed up with the accurate details, collected on the spot, of every thing that is useful in a medical and social point of view." He doubts not that "a work of this nature is sought for by all those who wish to visit the Spas of Germany;" and he hopes that the wishes of these amiable persons may be perfectly answered by the benevolence of his beautiful volumes. He "recommends this great tour to all idlers as a summer diversion, instead of broiling, at double the expense, at Brighton;" and he commences his own toils on the 13th day of August, 1836, by entering the land of Spas in an open britschka, the best sort of machine for framing observations, for adjusting facts, and for arriving at medical and social or poetical conclusions. His narrative is luminous and sprightly; he enlivens it with a fair proportion of the seeings, and sayings, and doings, of an experienced traveller; and by means of these, still farther enlivened with picturesque sketches of things, and places, and persons, he has succeeded most happily in making a book well qualified, by its value and gentility, to become a proper companion to those who follow

Dr. Granville's excellent advice, and haste away to commit themselves to the hands of *medicated* nature at the Spas of Germany.

Dr. Granville descants agreeably on his Spas under four distinct geographical groups. The first is his Baden-Baden and Wurtemberg group, and it includes his descriptive sketches of the Baden-Baden, Rippoldsau, Wildbad, Liebenzell, Deinach, Cannstadt, and Boll spas, on each of which he bestows a due share of friendly and philosophical attention.

Baden is "Queen of the Spas of Germany," the second most historical bathing-place in Europe. The place forms a most delightful summer retreat of the sick and the healthy, and it lies in the bosom of a most enchanting mountain scenery. You become almost romantic as you approach it on a road which keeps meandering into the bosom of the valleys; and when at length you enter the town, through a long avenue of poplars terminating in a shaded road, the sudden freshness is felt to be particularly delightful. By hills, the queen of spas is sheltered from the east winds and from the westerly gales; and on the north side her protection is still more complete, owing to the greater elevation of a mountain range. The place is only a few hundred feet above the level of the sea: there are some few degrees of thermometrical heat in the valley of Baden more than in the flat country near and out of it. At the moderate height of its position it enjoys a dry and very pure air, which exerts, as Dr. Kramer observed, a happy influence on the moral as well as the physical part of man. Dr. G. is disposed to think that this representation is not one of the exaggerations which physicians of watering-places indulge in, in behalf of their favourite spot of residence. The climate here is exceedingly temperate, and one of the most healthy in Germany.

Apparently a prodigious multitude of persons frequent this delightful retreat during the bathing season; "but," says Dr. Granville, "at Baden a little trickery is resorted to in this matter, just to raise its character by showing that a larger number of visitors flock thither than to any other Spa, for the benefit of its waters." He calculates, from observation of gait and countenance, that not one in a hundred of the many people seen there can possibly have the excuse of ill health for resorting to the place. Yet it has its patients, and many such there are who could not stay away from it, or change it for another place, without losing every chance of recovery.

There are eleven secondary mineral springs at Baden, besides the celebrated Ursprung, which pours out a profusion of thermal water, at a temperature only 58° short of the boiling point. According to Dr. G., this scalding water is used for almost every domestic purpose, including most of the culinary operations. It is, he says, perfectly clear, has a slight faint animal smell, a taste somewhat saltish, and, when drunk as it issues from the spring, approaching to that of weak broth; but, he adds, this taste becomes less pleasant by the mixture of cold water, milk, whey, or other ingredient. Its specific gravity is 1.030, that of distilled water being 1.000; a pint of it

contains nearly twenty-four grains of solid matter, comprising sixteen grains of common salt, six grains and a half of the sulphate, muriate, and carbonate of lime, and a small portion of magnesia, with traces of iron and about half a cubic inch of carbonic acid gas in addition. Its particular smell is due to the presence of extractive matter and of bath slime, a peculiar vegeto-animal substance, which hot-springs deposit at the bottom of reservoirs. When employed injudiciously, this excellent water sometimes occasions some injurious effects; when rightly used it, in some cases, produces beneficial results. A gay life may be led at Baden on very reasonable terms.

Travellers to the Wurtemberg Spas will be greatly exhilarated and edified as they go by the discursive and sensible observations recorded by Dr. Granville on his journey to the same destination; they are full of interest, novelty, and importance. He promises not soon to forget the delicious sensations for which he is indebted to that charming excursion. In his opinion the inhabitants of the Schwarzwald, or black forest, are ugly, and many of them are afflicted with goitre, or neck-wens; but the natural scenery of that upland region abounds with variety and loveliness. Nothing, he thinks, can equal the succession of beautiful changes which, at each turn of the road, present themselves to those who ascend the river Mourg and its enchanting valley. Like all mountain streams, this is insignificant at its source, which is double, near the highest summits of the forest; but it soon gains strength, and rolls onwards through its tortuous windings, more capricious than the coils of a great snake, or becomes precipitous, rapid, and boisterous. The Doctor could not help admiring the valley of Baiersbroun, surrounded by broken masses of rocks and lofty mountains—the wild cradle in which the romantic Mourg starts into existence.

Mineral springs abound in these regions. The Griesbach is a medicated water, charged with a predominant proportion of glauber salt; the Rippoldsau is a pleasant beverage, resembling Seltzer water in a great degree, as to taste. Both these springs are used as baths, which are accompanied with good accommodation for visitors, including two capital hotels and gambling-rooms. Large quantities of the Rippoldsau water are exported in earthen bottles, but little of it goes beyond the German frontier. Though highly sapid and even *piquant*, particularly when mixed with the *vin du pays*, there is in this water an after-taste of astringency, which is by no means agreeable.

Wildbad lies amidst the wilds of the Schwarzwald, whose mighty and columnar Firs give a sombre yet grand character to the country. On taking a hot bath at the *Fürsten*, or prince's bath, Dr. Granville found the water wonderfully affective, and this circumstance led him to institute a process of inquiry and reflection concerning the causes of its effects. It was a very nice bath indeed, and having enjoyed the luxury of an immersion in its waters, he thus describes the event in terms of grateful eloquence:—

"Having undressed in an adjoining room, where I found a sofa, chairs, a table, with a mirror, a carpet, and warm linen, I entered the bath at an hour when no other person was present. After descending a few steps from the dressing-room into the bath-room, I walked over the warm soft sand, and I laid myself down upon it, near the principal spring, resting my head on a clean wooden pillow. The soothing effect of the water, as it came over me, up to the throat, transparent as the brightest gem or aquamarine, soft, genially warm, and gently murmuring, I shall never forget. Millions of bubbles of gas rose from the sand and played around me, quivering through the lucid water as they ascended, and bursting at the surface to be succeeded by others. The sensation produced by these bubbles, as many of them, with their tremulous motion, just *effleuraient* the surface of the body, like the much-vaunted effect of titillation in animal magnetism, is not to be described. It partakes of tranquillity and exhilaration, of the ecstatic state of a devotee, blended with the repose of an opium-eater. The head is calm, the heart is calm, every sense is calm; yet there is neither drowsiness, stupefaction, nor numbness: for every feeling is fresher, and the memory of worldly pleasures is keen and sharp. But the operations of the moral as well as the physical man are under the spell of some tranquillizing agent. It is the human tempest lulled into all the delicious playings of the ocean's after-waves. From such a position I willingly would never have stirred. To prolong its delicious effects, what would I not have given? But the *Bad-meister** appeared at the top of the steps of the farther door, and warned me to eschew the danger of my situation; for there is danger even in such pleasures as these, if greatly prolonged. I looked at the watch and the thermometer before I quitted my station. The one told me I had passed a whole hour in the few minutes I had spent according to my imagination; and the other marked $29\frac{1}{4}^{\circ}$ of Beaumur, or $98\frac{1}{4}^{\circ}$ of Fahrenheit. But I found the temperature warmer than that whenever, with my hand, I dug into the bed of sand, as far down as the rock, and disengaged myriads of bubbles of heated air, which imparted to the skin a satiny softness not to be observed in the effects of ordinary warm baths."

This bewitching water has neither taste nor smell; it is colourless, transparent, and brilliant. That it is of the purest softness is evinced by the cosmetic and striking changes it readily produces on the skin. Its chemical composition, according to Dr. G.'s judgment, is probably one of the simplest in nature; it contains not more than three and a half grains of "fixed principles" in a pint, and of these common salt makes just one-half, the rest consisting of carbonate of soda and glauber salt, sulphate of potass, carbonate of lime, and the carbonate of magnesia. With regard to its gaseous or aëriform contents, there is, 1st, the small quantity of gas which is disengaged by *boiling* the water; and 2nd, the gas which rises naturally from the spring, in numerous bubbles. The chief and predominant merit of the Wildbad water is its temperature, and this has continued the same throughout a long succession of years. After mature consideration of the subject, the Doctor confesses that he has been led to ascribe to the *temperature* of this and other warm mineral springs the principal effects which they produce on the human constitution. But it is not the *thermometrical* temperature to which he alludes when he proclaims this opinion; it is to the *caloricity* of the water

* The person known as the "bath-man" in England.—ED.

which is not to be measured by Reaumur or Fahrenheit; a principle imparted by nature to such springs, from sources that, as yet, have escaped detection, but which, at no distant period, will probably be found to be connected with electrical powers, and, therefore, not appreciable by the ordinary instruments of thermometrical mensuration. Altogether, the small village of Wildbad appears to have left favourable impressions on the affectionate disposition of Dr. Granville, and he records the kind sentiment that this pleasant little town is equal, if not superior, to most of the principal Spas of Germany, in the beauty and romance of its environs, the mystery and tradition which attaches to some of them, the geology of its neighbourhood, and the rich harvest it offers to the botanist. The waters of Wildbad cure some affections and relieve some diseases: its air is pure and bracing; and, in general, its climate during the three months of the bathing season is unexceptionable.

Another of the many "mountain bosoms" of the Schwarzwald, is the valley of Nagold; and in this enchanting region stands Liebenzell or love-cell, a small town which possesses a "spring of health" whose powers and virtues have proved of essential service where the magical waters of Wildbad were found too irritating or inappropriate. At this lovely spot the mineral spring has a temperature of about 77° F., and a pint of it contains 4½ grains of saline ingredients. Its taste is slightly saltish, and in appearance the water is beautifully clear and transparent. It has performed some very striking cures, which Dr. G. enumerates.

Deinach is situated four miles from Wildbad, in the heart of the Black Forest: it has two kinds of mineral springs, which rise close to each other in a sandstone rock. One of these yields an acidulous water, pure, pellucid, and sparkling: the other supplies a turbid water of a greenish colour; it deposits a large quantity of oxide of iron, and its taste is intensely styptic. The temperature of these springs is about 45° F., and it never alters under any variation of the weather: they act beneficially in several diseases. Every thing is moderate in this sequestered retreat; but Dr. G. should never make it his summer residence, even with that advantage.

Cannstadt is a neat and pretty little town, with gardens and promenades which brought strongly to Dr. Granville's mind the delicious parterres and groves of Aranjuez. Sulzrainquelle is its principal spring, and sixteen ounces of this are impregnated to the extent of forty-six grains, with common salt, Epsom and Glauber salts, the carbonates of lime and iron, and a little carbonic acid gas: its temperature is 66° F. This water is pleasantly acidulous, *au premier gout*, the Doctor says; but it leaves behind a smack of rusty iron, with corrugation of the mouth and tongue, and a taste of common salt into the bargain, by no means agreeable.

Dr. Granville thinks the hotel König von Württemberg, at Stuttgart, might very well be made the head-quarters of an invalid desirous of enjoying the benefit of the Cannstadt waters. At this royal house of entertainment, and for four sixpences too, he partook

of a savoury and substantial dinner, distributed into three courses of things with comical names, and a dessert with a pint of wine, which was not despicable. Inspired with the exhilarating repast, he joyously exclaims, "What cockney within the smoke of the kitchen of the Albion or of the Freemason's can hope to linger over, still less to partake of, the tithe part of this long list of *gustables*, at the bare name of which his mouth would water, for only twice twelve pence of lawful British money?"

Boll is a beautiful village: it has long enjoyed a national, and even European, renown. It is placed on an elevated plateau, formed on one of the pinnacles of the Suabian Alps: on the one side it is flanked by a ridge of these mountains, which extends as far as the eye can reach; while on the other side a dense forest comes down to the very edge of the village in its rear, and forms a dark background to the place, giving it an imposing character. The contemplation of the whole scene is full of interest, when the eye rests on the once mighty Hohenstaufen, the cradle of the German emperors.

The spring at Boll is sulphureous: it rises through a soil consisting of bituminous marl and a species of sulphureous gravel. Its temperature is 54° F., and its predominant saline constituents are Glauber salt, and the carbonates of soda, lime, and magnesia, with traces of iron and manganese, and strong indications of bitumen. Its gaseous contents are carbonic acid, azote, and sulphuretted hydrogen. It proves of essential service in diseases of the skin, scurvy, psora, and other "deturpating complaints;" in nocturnal pains of the bones from "erotic affections;" and in carious ulcers of the legs, contraction of the limbs, and lameness. It is a depurative of the blood, when this is vitiated. Dr. G. considers the mineral water of Boll, when taken internally, capable of producing the most happy results.

Provisions are cheap at Boll: it is a comfortable place: it offers to the visiter a scene of civilization in the way of public and private amusements, occupation of the mind, and social intercourse, which could hardly be expected in that lofty and secluded region. A band attends on week-days, and on every Sunday or Saint's-day there is dancing after dinner. The water is pumped from the spring by means of a tread-wheel: the environs are picturesque, the roads are good, and the main-road is excellent.

Dr. Granville offers as his reason for having purposely given a very extended account of the principal Wurtemberg Spas, the complete ignorance which prevails in this country respecting them, and the serious loss entailed by that ignorance to many thousands who might otherwise have found health at some of these watering-places. He adds that they are the least expensive of all the frequented Spas of Germany; that every one of them is situated in the centre of some romantic and beautiful region; and that, on these satisfactory grounds, they deserve and ought to command attention.

Having discharged his professional duty to the waters of Wurtemberg and its highland scenery, Dr. G. takes his departure for

the Bavarian capital. He likens the districts he passed through during his journey to perpetual gardens: they are not limited by landmarks, nor do their crops of wheat or barley exhibit a single vestige of any weed or an intruding red poppy. Trees, single or in groups, occur sufficiently often to diversify and break the monotony of the extensive sheets of arable land outstretched before the view. The ever-changing series of hills was often interrupted by dense dark-green, and ancient plantations, from the small copse to the extended forest. In the valley of the Nagold, women were principally engaged in reaping with the scythe, and they seemed to get through their task with surprising rapidity. Before arriving in sight of Ulm the Doctor journeyed "through a road interesting to the geologist, and the lover of Suabian *antiquities*, in many parts of *which* the remains of ancient feudal and baronial castles appear planted in midway air, or on the summit of some of the most pointed and fantastic hills." He saluted the Danube, and indulged in a soliloquy: he saw the imperial abbey of Elchingen, and it made him contemplative. His sketches of Augsburg are brief, but graphic: it is an interesting city in many respects: one of its curiosities is the hotel of the Three Moors, which must be seen to be comprehended. The streets are paved with small stones, without any *trottoirs*, and are very unfavourable to the pedestrian; they hurt the Doctor's feet. On the road to Munich he had an illustration of the different manner in which climates affect different individuals, even of the same family, and all equally in health. After ascending the last hill by a tortuous yet excellent road, he caught the first glimpse of the snowy Alps, and here the effect of the air upon his spirits was suddenly marvellous, and continued through the rest of his journey. A buoyancy and elasticity came over his feelings which he hailed as totally new: he was evidently in a congenial climate, and the energy of all his faculties evinced how beneficial such a climate was to his constitution. On his two sons the effect was neither so striking nor so decidedly favourable; and this furnished him with the illustration.

Munich is the capital of Bavaria, and it is the head of Dr. Granville's *second* "geographical group," which includes the "Salzburgian Spas;" and on this metropolis he exercises the spirit of topographic oratory with his usual vivacity and judgment. He gives a sublime prescription for combining the elements best calculated to effect the alterative process by which a city may be converted into the "Fair Queen" of an empire. The ingredients are these:—a higher state of knowledge, a greater encouragement to learning, the promotion of industry, the patronage of the liberal professions, the foundation of institutions suited to the times, the erection of vast and magnificent buildings, the cultivation of a pure and correct taste in architecture, in painting, and in sculpture, and a more enlightened government. Munich seems to have possession of these high requisites: at no distant period, the Doctor thinks, it will be the capital of South Germany. It bids fair to become the Athens

of Germany—it is a fair, a promising, a delightful capital. At this fascinating mother city he found an opportunity of expounding to Prince Wallenstein his most enlightened views concerning the nature of oriental cholera, and the secret of its pretended contagion. There is but one burial-place at Munich, situated outside the town; and, although vast, it is crowded to excess.

One fine morning as Dr. G. was journeying from Munich to Saltzburgh, the sun rose in the east before him, above the top of the loftiest pine ranges which intercepted its rays at its birth. The white mist gradually dispersed, and the myriads of gossamer webs that veiled the tips of every branch and shrub, first sparkled with their seed-like diamonds as they caught the first rays of the cheering planet, and the next moment their fairy texture, night-woven, was dissipated. Seeing thus the charms of morning, and feeling their benignant influences, the Doctor forthwith discourses with himself, and says, “Who would not witness, and, witnessing, could not enjoy, such an early morning scene; to catch Nature at her toilet, when her most delicate beauties are unveiled to our sight? Have we not here a solution to a part, at least, of the secret of health recovered and disease removed when distant mineral springs are visited? Does not the inhaling of the purest and most balmy air, enriched with aromas and probably with medicated effluvia from the surrounding plants, account for a portion at least of the recovery of the travelling invalid? For myself, at such a conjuncture I always felt as if my pristine vigour, impaired by a laborious life, had been restored to me for the moment; and I would have willingly loitered for hours together to enjoy the like spectacle and quaff the like draught of renovated vitality.” With such inducements to visit distant mineral springs, the travelling invalids of Germany and Italy will certainly hasten in hundreds to the Spas of Brighton, Buxton, and Bath, and there obtain a portion of their recovery by inhaling the balmy air enriched with aromas, and probably medicated with the effluvia of woodbines and beans.

Saltzburgh is an old archiepiscopal city, having its gigantic citadel seated on a calcareous rock in the very heart of the place. It is situated in an amphitheatric basin, and offers so many natural beauties of every description to the eye of the inquisitive traveller, that it becomes quite an object of interest as well as admiration. Some of these beauties the Doctor sketches cleverly, and then puts himself *en route* for the wilds of Gastein, the road to which, he says, is both interesting and romantic, and as little known to Englishmen as the nature and powers of its mineral springs. His picture of a thunder-storm is inspiringly pathetic. He was traversing the midway region of a mountain range, along the tortuous and giddy windings of the impetuous Salza, and surrounded on all sides by enormous crags with a solid screen of alp on alp unreachd before him. He was hastening onward with all possible rapidity for the bath of Gastein, his scope and object, when, he says, “during the night a thunder-storm burst over our heads, and the peals, echoing from

mountain to mountain, seemed to crash on some distant headland, only to make new echoes and to multiply the storm. The lightning leaped, and streamed, and quivered between each bellowing of the thunder, and seemed to threaten the stoutest rock and loftiest tree in the surrounding forests. The deep and fearful gloom left by the vanishing lightning was not so awful as the effect produced by its returning momentary splendour, which showed for an instant the dark abyss and dreadful chasms before us and by the side of us where none had been suspected. As if to impress us with the tremendous depths of these gulphs, the lightning would often, in zig-zag lines, run along their sides, or, like the hissing snake, unfold its coils to slide the more quickly down the bare rock. The whole scene was awfully sublime; and the distant, scattered, broad drops which pattered down, driven in all directions by the many gushes of wind that came sweeping through every mountain gully, left us no repose. Torrents of sheeted rain at last seemed by their diluvial power to silence the roaring of the gale and to quench the lightning's fire. Before the dawn of day Nature had once more lapsed into her solemn attitude of rest."

Gastein is seated on the highest pinnacle of one of the mountain-ranges which slope towards the valley of the Salza, nearly three thousand feet above the level of the Mediterranean sea. Dr. G. represents this as a very wonderful village, with its gigantic mountains, its roaring river, its majestic waterfall, and its mighty cataract, which descends, for 650 feet, nearly vertically from a shelving rock. Here he caught a patriarchal physician eating his noon-day dinner, *en demie chemise* with part of the viands lying on his knee, and part of them on a piece of furniture. This sedate personage welcomed the stranger to Gastein, and "hastened to resume his coat and waistcoat, smiling with an ineffable grin of black-teeth demonstration." The traveller protests, however, that his worthy entertainer had a much better furnished cranium than was expected; but the good man had one fault, he had become a proselyte to the dangerous heresy of *Infiniterimophysicalism*, as it stands in Dr. Granville's neological vocabulary!

From the precipitous rocks of Gastein five different springs pour out thermal water, at 116°, F., of temperature. This water issues without the smallest noise, and without forming any air-bubbles: it is as bright and as pure as the finest distilled water, and it almost surpasses this in transparency. In the baths or reservoirs it never deposits the smallest trace of sediment, nor does it acquire any disagreeable smell. It is all but tasteless; smell it has none: "yet," says Dr. G., "on entering the deep caverns of the two principal sources, I was sensible of a certain peculiar odour, not unlike that which a hard-boiled *fresh and sweet egg* gives out when the shell is removed. By testing and analysis, Chemistry has detected no fewer than twelve distinct saline ingredients in this nearly insipid water; these altogether amount to three grains in the pint, and of these the glauber salt makes up the largest proportion. It is chiefly

employed in baths, but inhalation of its steam into the throat and lungs is considered wonderfully curative in cases of incipient consumption. Dr. G. adds an ample catalogue of formidable maladies in the treatment of which he is confident the Gastein baths, judiciously and sufficiently used, will not disappoint the patient. With a view to unriddle the mystery of thermality in mineral waters, he risks a repetition of the ancient conjecture, that the heat developed in hot springs is of volcanic origin.

Hof-Gastein possesses no mineral springs of its own; it receives its thermal water from Gastein in wooden pipes, which retain more heat in the passing fluid than is required for the purpose of bathing. The former is a considerable village in a plain, within sight of the latter place, where want of room for visitors gave rise to the reputation of this as a watering-place. Many people, after trying the mountain air at the fountain-head, come down to Hof-Gastein for a change of climate, and find the baths here equally efficacious.

Dr. Granville finishes the description of his "second geographical group" with an account of adventures, observations, and reflections, as they occurred on his journey to the Bohemian Spas, and on excursions into various parts of the intervening country, including his visit to the salt-mines at Hallein, and its dark subterranean lake of brine. When exploring the cavern of a thermal spring at Gastein, he collected some of the *schlegm* or slime which adheres to the rocks around the source itself, where no day-light penetrates; he culled some specimens, also, of the slender stalactitious depositions which hang from the same rocks, and some of the green, grassy, slippery *conferva thermalis*, found at the bottom of the channel in which the hot water flows. On his return to Salzburg he presented these curiosities to Dr. Werneck, for examination with his microscopes, one of which is said to possess extraordinary power and distinctness. The *schlegm* is a loose, fungoid, ropy deposit, formed in the dark recesses of the hot springs, where no sun-light ever enters. Its colour is sometimes white, sometimes brown; it is not of animal origin, but of a vegetable and cryptogamic nature. When a minute portion of it is diluted on the object-glass, it exhibits several pear-shaped capsules, standing in groups upon a "slimy, felty pericarp, formed of succional vessels," which are the real receptacles of the seed. The thermal *conferva* is never found in hot mineral waters where light has no access: it vegetates on the bottom of rills outside the caverns, and in open reservoirs, wherever rough bodies or obstacles to the water's course enable it to attach itself. This *conferva* might be compared to a green silk plush, the hair of which has been pressed and smoothed down in one uniform direction. Two classes of beings endowed with motion, and of striking and many-varied forms, are distinguishable, in the smallest piece of this substance, by the microscope. Some of these are vegetable, others animal, infusorial animalcules: the latter find food and nest in the former, which alone gives its green colour to the *conferval* production. While under observation, some of them were seen oscillating from

side to side, like a pendulum ; others were rearing one of their extremities from the prostrate to the vertical posture ; and other gigantic bino-gastric creatures, disentangling themselves from the trammels of many green fibres, advance majestically with an extraordinary figure, and devour most gluttonously the *monas*, the *atomus*, the *guttula*, and numberless other matters, as they appear in succession. Whenever the smallest imaginable portion of the stalactitious *tubuli* is broken into powder, and subjected to the microscope, it is shown to consist of most beautiful and delicate crystals, distinctly defined ; its ultimate molecules appeared, to Dr. G.'s eye, to be endowed with movement. Neither of the experimenting Doctors seem to have conceived the idea that the *Conservæ thermales* vegetating externally to the cavern, might be the pear-shaped capsules of the *schlegeln*, with their felty pericarps, vegetating in ill-aired darkness within it, but farther developed under the genial action of light and the atmospheric air.

Carlsbad is "King of the Mineral Springs." Dr. Granville places it at the head of his seven Bohemian Spas, forming a "third geographical group," which, besides their king, includes those of Marienbad, Egra, Pullner, Seidschutz, Seidlitz, and Toeplitz, each with its peculiar excellencies and attractions.

Sprudel, the *brudel*, or bubbler, of Carlsbad, is the chief of seven streams that burst through a calcareous crust, and launch on high a column of hot water, which, in descending, assumes the semblance of a liquid weeping-willow. At a very early hour of morning—when, in these unsophisticated retreats of invalids, all the world is up and stirring—the Doctor hurried to "that most extraordinary phenomenon of Nature," with all the impatience of one who is eager to satisfy himself, by ocular demonstration, of the truth of what seemed almost fabulous in description. Nevertheless, at the sight of that celebrated fountain, to which the curling vapours that hovered over its colonnaded temple directed him without a guide or a question, he felt that all the descriptions he had read of it had failed to convey the impression he experienced. The sudden view of the violent, lofty, constant, and prodigal out-pourings of hot water from the bowels of the earth, foaming in the midst of its clouds of vapour, within forty-five degrees of the boiling point, on the very margin of the Teple, a cold, placid, and sluggish stream—this sudden view rivetted him to the spot for a brief period. Although pressed on all sides by the increasing throng of water-drinkers, he felt himself alone, absorbed by this striking object. He stood contemplating it for some minutes, foolishly imagining that the next moment would reveal the secret of this natural magic. But the crowd of eager invalids who surrounded it, keeping at a respectful distance from its scorching spray, seemed to look for health in the spring, without ever thinking, as he did, of the two great agents combined—heat and water, with a sprinkling of soda—from which they were to obtain it. Monologizing gravely, he asks himself, "What is it that imparts to this mysterious current that violent im-

pulse which makes it spring from the bosom of the earth with an upright jet of eight or nine feet of elevation, from the aperture in the rocky crust underneath the building raised over it?" A central fire, is the solemn response. The Sprudel, then, is the ardent offspring of an unquiet and relentless agent, which fills the atmosphere with hot vapours, and impetuously over-runs all the bounds whereby art has vainly attempted to restrain its endless throes. The size, height, and appearance of its jettings is for ever varying; and in its upward and downward course it is accompanied by a noise combining that of the splashing of a *falling* cataract and of the boiling of a vast cauldron of water—a noise which, like the stream of water it accompanies, has ceaselessly continued for numberless centuries—a noise which, in times of darkness and superstition, would have induced man to fall prostrate, offering to its cryptic cause the homage of his amazement and adoration.

One pint of the Carlsbad thermal water contains $31\frac{1}{2}$ grains of solid saline substances, and a large proportion of these consists of glauber and common salt, with carbonate of soda, and traces of iron and iodine: its æriform fluids are said to be carbonic acid gas and sulphuretted hydrogen, but this last is doubtful. It emerges from its source at 170° , F., of temperature. This water emits an *animal* smell; its first taste is saltish, its after-taste becomes alkaline. The Sprudel spring is useful in some classes of complaints; it dissipates adhesions; but "it is the despondent, dejected, misanthropic, fidgety, pusillanimous, irritable, outrageous, morose, sulky, weak-minded, whimsical, and often despairing hypochondriac—made so by continued indigestion, by obstinate and unremitting gout, by affections of the nerves of sympathy and of the gastric region, and by other equally active causes—that Carlsbad seems pre-eminently to favour." The companion of Dr. G.'s two sons drank of all the springs; he attacked the Sprudel at once, and in quantities of several goblets, and the condition of the system which followed was always one of comfort.

Great must be the delight derived by the philanthropic spirit from meditation on a scene of the Sprudel at the balmy hour of morn, so favourable to the creations of ideality and devotion. By Dr. Granville a scene of this sort and the scenery are thus depicted:—

"The eagerness with which the different people of Carlsbad, of both sexes, rush towards the Sprudel at six o'clock in the morning, to partake of its salutary waters, is an interesting sight. In its appearance the motley throng is quite theatrical, and the many-shaped and many-coloured costumes worn by them form a living illustration of geography. The multitudinous faces of which that throng consists—their divers modes of drinking the hot mineral fluid—the various effects produced by it on their countenances—the accumulation of individual cases of disease concentrated under one roof, among which the eye of the medical man detects not a few disorders that are cankering their victims—all these things I saw and felt at my first visit. The company assembled was very numerous: the colonnade in front of the source was full. The restless multitude moved to and fro in every part and in every direction of that covered promenade, which runs between a narrow

parterre of flowers on the one side and the sluggish and dirty Teple on the other. As early as five o'clock in the morning, the little nymphs of the Sprudel—smart, lively young lasses—are in attendance to distribute, with critical impartiality, the bounty of their spring. They are all dressed alike, in green dresses in the morning, and in light-coloured robes in the evening. Standing at a little distance from the boiling jet, and holding in their hands a stick, four feet long, with a cup-holder fastened to one end of it, these damsels extend the latter towards any one whom they see approaching with his beaker, receive it in their cup-holder, and plunge it within the smoking column of water. From this it is immediately withdrawn quite full, and presented to the same individual again, who, with what relish he may, disposes of its contents."

Falling into a philosophising mood, Dr. G. instituted an admirable experiment, in the centre of a square and lofty pavillion where the Sprudel rises. Thus, by means of accurate and diversified observations, he ascertained that there were some of the sickly who sipped with pigeon-sips the salutary elixir, giving only a gentle shudder as they drank it; and these were ladies: there were others who, more adventurous, swallowed half a beakerful at once, with only a slight pursing up of the lips, and looked round for approbation; and these were *esprits forts*, the Sprudelian dandies: my Lord A. and Sir J. L. looked grim when disposing of their dose, and declared it had no taste: one who thought himself unseen, was detected in bringing slyly out of his large *beniche* a lump of sugar, which he kept in his left hand ready to pop into his mouth the moment his beaker had quitted it; and he was one of the subjects of Mahmoud who had not yet exchanged the turban for the ugly and tasselled red cap: another who had just received his beakerful of the Sprudel from the fair hand of a green-mantled maiden who eyed him with a malicious meaning, retired quickly into a corner, and, turning his face to the wall, swallowed in secret the noxious draught; and he was a Polish Jew, his dress betrayed him. In this manner the doctor watched the ever-varying modifications of the human countenance as they were produced by the influence of one and the same agent; and from these observations, constituting clear principles, he arrived at the conclusion that men are but overgrown babies.

Without exception, every one of the Carlsbad thermal springs deposits a large quantity of calcareous matter, which forms stalactitious concretions; and as these depositions take place abundantly before the very eyes of those who attend daily to drink the water, many of them have been deterred from continuing its use, under an apprehension that similar incrustations might take place in the bowels or on the teeth. Dr. G., however, shows that this prejudice has often been combated by superior reasoning; and he adds the reason which satisfied himself that, from drinking at the thermal sources of Carlsbad, none need be apprehensive of having an intestinal concretion.

Dr. Granville wisely takes Professor Ehrenberg, of Berlin, for

his guide, when retailing microscopical observations on the animalcules of hot mineral springs. The Professor has adopted a curious and novel view of this subject, which he has minutely and repeatedly examined. He made experiments upon specimens sent to him from the thermal sources of Carlsbad, and he contends that living fossil infusoria exist in the water. In the peat-bog of Franzenbad and the meadow-earth of Billin, he discovered the same kind of animalcules. In all these specimens he detected eighteen different species of moving fossil bodies, belonging to the family of *Bacillariae*, which have hitherto been considered as forms of plants by practical naturalists. Professor Ehrenberg has published figures of these moving fossil bodies, and he assigns several powerful reasons for believing them to be *fossil animalcules*. It is his opinion that these creatures are constantly reproduced, and form many of those stratifications of the earth's surface which have hitherto been looked upon as the remains of extinct series of marine animals, left after great geological commotions. He enters upon a curious calculation of the number of such animalcules required to make up a given quantity of the fossil stratifications. He is firmly persuaded that these animalcules are generated every moment; that after their death they form entire rocks; and that, therefore, they ought to be taken into consideration by those who endeavour to explain the structure of the globe. He makes the marvellous statement that twenty-three millions of such animalcules would make up a cubic line of the rock, and actually be contained in it. Now, as there are 1728 cubic lines in a cubic inch, the latter would then comprize nearly forty billions of the animals, the siliceous body of which must weigh about $\frac{1}{177}$ millionth part of a grain: and as to the size of these living beings under a fossil shell, the Professor has ascertained it to be just one-sixth of the thickness of a human hair.

Dr. G's. sketches of Carlsbad are various and elaborate, and his information concerning the place and its people is altogether very multifarious and exceedingly instructive. It is replete with sagacious remarks and scientific inductions, enlivened with frequent fine touches of the gastronomic philosophy: these last are always exquisitely brilliant and tasteful. One remark of his merits the consideration of all true philanthropists and moralists. He understood that this Spa had been deserted by the vicious and the mere loungeur, and was become a real retreat for invalids; and he also understood that this happy change was effected by creating for such fribblers the disappointment of finding little fun there and still less to eat, with the absence of gambling and the non-existence of more private iniquities. With respect to diet at Carlsbad, there is a medico-sprudelian dish, which once was, and still ought to be, in great vogue with invalids and other visiters. By throwing a little butter, flour, and salt, and the yolk of an egg, with slices of bread, into a proper quantity of the hot mineral water, the thrifty housekeepers cook you up a soup in the twinkling of an eye. This is distinguished by the expressive ap-

pellation of *Sprudel soup*, and verily it must be equally delicious and salutary. It is the duty of genuine patriots to bring the mess under the notice of temperance societies.

Impressed with a due sense of the hospitality and comfort he experienced at the "King of the Spas," the complaisant Doctor breathed a grateful aspiration for its prosperity as he set out on his journey for Marienbad, whose salutarious sources were first made known to Europe about the beginning of the present century. Although this is a watering-place but "of the other day," yet it already vies with the principal Spas of Germany for the beauty of situation and embellishments, the great affluence of strangers to it from all parts, and the tried efficacy of its springs. At a distance the place exhibits the semblance of an immense garden; as the traveller approaches it his first impression is quite delightful. Dr. G. stopped for a few minutes to enjoy its contemplation, and he styled it the "Garden Spa of Bohemia," which has some pleasant distractions, but is not rich in artificial amusements. In his peregrination to the "Temple of Health" he was seeking, the Doctor met herds of very small cows, tended by fine, healthy-looking peasants. These animals resemble the Welsh ones, but they have a far prettier head, and prettier limbs; their coat is of a uniform rich brown tint, sleek and shiny. Both men and maidens were seen walking barefooted, although he was within a few minutes of an assemblage of gentle blood, crowded in gay saloons, or dispersed through groves and gladsome promenades.

Marienbad and the regions around it afford prospects of the loveliest nature imaginable. Here, too, you expand your lungs with freedom and elasticity: the air is light, pure, ethereal. After a summer's shower, the renewed freshness of the atmosphere carries on its wings a balmy fragrance from the surrounding forests; and the deeper green with which the white Grecian-and-Roman-looking houses of this lovely place are intermingled in profusion, adds to the beauty of the scene, and almost converts it into one of enchantment. This of itself, Dr. G. feels convinced, would cure many of those vile stomach disorders which the London doctors strive in vain to remedy with that eternal and never-varying *blue* pill and its *sable* follower, with their *golden* creations.

All the Marienbad waters are cold, and their sources are found on flat ground; some of them exude from peat or a marshy soil, others from fissures in the granite. They are all accompanied with more or less of free carbonic acid gas, and this imparts to them a tartness which disguises their natural saline taste. At their first issue they are transparent, but afterwards become turbid, and deposit a yellow-ochry sediment. Immediately after being drank they feel cold to the stomach, and the gas rises into the head as after drinking a glass of champagne. These springs are of two kinds, saline-alkaline and alkaline-chalybeate; the latter produces tonic, the former has aperient effects, and they both operate in nearly the same way as the same kinds of water, having the same strength, are used to do at other places.

The resident doctor lauds the Kreutzbrunnen to the skies, and looks upon it as a panacea in all chronic affections, particularly those of the digestive organs. It is his oracle, and the affection he bears it is almost romantic; a clear proof that the worthy man is not without a failing of his fellows—the weakness of waddling on hobbies. This spring, says Dr. G., is his *maitresse*, although he is aware that, at the other Brunnens, the principal physicians bear an equally ardent and undivided love to the object of their adoration. When a glass of the Kreutzbrunnen is drank cold, the water feels uncomfortable to the stomach, but walking removes that sensation. Its taste is pleasant and *piquant*. When mixed with an equal quantity of the same water, treated so as to give the mixture 90°, F., of temperature, the taste then is exactly like that of veal broth clear of fat and with a little salt in it—very pleasant. When its heat is raised to that of the Sprudel, at Carlsbad, the water loses its agreeable *gout de bouillon*, and acquires a stronger, more sapid, more saltish taste, somewhat astringent. Great emission of the gas, or eructations, follows a draught of this spring; but the head remains undisturbed, and the digestive organs still. Taken thus it is an invaluable remedy in all bilious complaints, without requiring the least assistance from mercury. The addition of warm to the cold mineral water instantly destroys its limpidity, and gives it a gruelly appearance.

Adding descriptive observations on the properties of this and the other springs of Marienbad, on its gas-baths, its topography, society, and scenery, Dr. Granville concludes with the remark that, with all its advantages and amusements, Marienbad is not a Spa of pleasure. It is a lovely and enchanting retreat for invalids, which offers to suffering humanity, in a sequestered valley, a safe, certain, and prodigal source of relief, away from the bustle and din of cities, as if Nature pointed out to us that health is best obtained in seclusion.

Franzenbad is the Spa of Egra, and it has two important springs—the Franzenquelle and the Salzequelle, whose properties coincide greatly with those of the waters of Marienbad, from which they also differ very little in temperature. According to Dr. G., there is a notable difference in the physical effect produced by each of these springs on the constitution; both are equally active as deobstruents, and both are digested with equal ease. But while the *first*, containing a larger proportion of iron, stimulates and excites during its operation, and is therefore inadmissible in cases of great irritability and fulness of blood, the *second* cools and tranquillizes, is less stimulating, and purifies without disturbance of the nervous system.

This place also has an extensive establishment for mud-baths, and these are represented as being specific and infallible in cases of excessive debility and prostration, particularly in paralysis of which gout has been the cause. Dr. G. testifies that the stuff used for making one of these baths is an agent possessing infinite, almost dangerous, power. It is quarried in an adjacent field, by means of spades. He saw a layer of it nearly twenty feet deep, immediately below the turf,

lying upon a bed of sand. The mass looked moist, and had an intense as well as most beautiful jet-black colour. Throughout it are found some curiously stratified thin plates of iron pyrites; some of these are nearly a foot square, and upon one surface only, the other being smooth, they have depositions resembling fossil plants of the Reed and Broom genus, in high relief: the whole is very hard and difficult of fracture. These masses are found, at all depths, in the stratum of the peat or bog-earth, and at various angles of the horizon. After exposure to the air for a few days their upper surface appears covered with a yellowish-green efflorescence, which, when tasted, imparts to the tongue the sharp sensation produced by sulphuric acid; its smell also resembles that of the sulphurous acid gas. When tested with litmus-paper, the colour of this substance is instantly and deeply reddened. This bog-earth, being brought to the bathing establishment, is thrown into two very large wooden vats standing under cover, at the height of four feet from the ground; and the earth being diluted there with mineral water, steam is made to pass through the mixture, which is stirred up constantly, until a proper degree of heat as well as consistency is obtained. Each bathing-tap being then pushed under one of the vats, the contents of this are allowed to escape through an opening until the tub is nearly filled, when it is wheeled into an apartment and used. At first the temperature is very high, but it is allowed to cool down to 80°, F., the degree of heat at which the mud-bath may be taken without causing excessive irritation. This kind of bath has the consistence and appearance of a semi-fluid poultice of bread-crumbs coloured with the blackest ink; and it exhales a smell not unlike that of pyroligneous acid, the taste of which, also, is retained for many hours by the bather's skin. On coming out of the bath, and having the mud washed off with warm mineral water, the surface of the body feels soft, and looks almost like satin.

The mud-baths of Franzenbad increase the action of the skin, are solvent as well as emollient, and stimulate the nervous system. These effects are attributed to four principal elements found in the composition of the bath—the fatty and peaty matter, the caloric, a highly volatile substance, and the metallic and saline ingredients. When the mud is thrown away it soon exhibits superficial strata of sulphate of iron and Glauber salt, with a large quantity of free sulphuric acid.

So profusely is gas distributed about Franzenbad that one may see it, feel it, and disengage it, in every part of the town and country. There are gas-baths at this place, and these have their supplies from the gas which issues through a tube plunged into the ground within the establishment, at the rate of five thousand seven hundred and sixty cubic feet in an hour. After repeated trials, it is regarded as being nearly pure carbonic acid gas, and its application in the form of a bath has been attended with beneficial results.

Dr. Granville deals very compendiously with the Spas of Pullna, Seidschutz, and Seidlitz. The first is a miserable-looking village,

and its waters are bitter; the second lies in a plain, and its water, though intensely bitter, is an effectual purgative; and who has not become acquainted with the name of Seidlitz, through its gentle and pleasing aperient salt? which, in fact, the Doctor says, has nothing in common with the chemical component parts of the genuine Seidlitz water of Bohemia, except the name. These three springs have the temperature of 58°, F., at all seasons; but no patient frequents them, because the locality would be unfavourable for the establishment of a watering-place.

Toeplitz is a gayish place, and it occupies a situation partly on the patrimony of the Prince de Clary, in the midst of a rich country smiling all around with Nature's bountiful gifts. Placed outside the bath-houses, a monumental stone records the traditionary story of the first discovery of its hot mineral springs. Here, as Dr. G. gives it, it was not a stag or a dog falling into the *scorching* stream, which by its (the stream's) cries called the attention of man to the existence of a new blessing; but they were pigs which, having fallen into *hot* water before their time, proclaimed by their grunting the existence of what has given Toeplitz a celebrity of eleven centuries, and a seniority over every other mineral Spa of Germany. This place has long been the venerable resort of the high-born and the humble, the hale and the unhealthy. The influx of invalids to its springs is numerous and brilliant; its baths, both private and public, are excellent; its comforts and embellishments are worthy the patronage of crowned heads; and the living at Toeplitz is beyond comparison, Dr. G. declares, cheaper than in any other watering-place he had visited. Its waters are thermal, and the hottest of them emerges from a crevice in a rock of porphyry. Their specific virtue lies in their power of restoring the cripple to perfect motion and elasticity. Altogether they are nearly as good for every useful purpose as those of the Beulah Spa or the springs of Strathpeffer; so that for this and the other reasons it may be usefully frequented by the "travelled invalid," for whose benefit Dr. G. consigns to his pages the faithful and facetious observations wherewith he completes his last "geographical group" but one, and the last is made up of the

Bavarian and Nassau Spas, which are those of Liebenstein, Kissingen, Bocklett, Bruckenaue, Hombourg, Soden, Seltzer, Geilnau and Fachingen, Schlangenbad, Schwalbach, Wiesbaden, and Ems. Dr. Granville's narrative of his pilgrimages to and around these respectable places is, as usual, exceedingly varied and animated. Two only of their Spas are thermal; the rest have a low temperature, and possess but a moderate impregnation of saline ingredients. They produce effects on the persons who employ them, internally or externally, not very much different from those caused by the same kinds of mineral waters in France, England, and Italy, when similarly used in diseases and circumstances not essentially dissimilar. Altogether, his pictures of this last "geographical group" are as happy and as graphic as those which impart their characteristic features

to his previous labours ; and, indeed, there is a generous wisdom, significant of extensive experience, in the accumulation of particulars enumerated by him as requisite for the guidance of "travelled invalids" as they hasten from home in the hope of being "rejoiced that they had exchanged art for nature" and for health at the Spas of Germany.

Dr. Granville's volumes have a very handsome appearance, and are sufficiently well adapted to allure the admiration of a fashionable patronage with its desirable results. His prints are neatly executed, his pages are printed with a clearness that will ensure comfort in their perusal, and the purity of his philological attainments is exemplified most beautifully in the liberal discretion wherewith he selects the finest French phrases, and applies them as a remedy for the natural sterility and harshness of our vulgar English tongue. May he long enjoy the recompense of his meritorious exertions !

Excursions through the Highlands and Isles of Scotland in 1835 and 1836. By the Rev. C. Lesingham Smith, M.A., Fellow, and late Mathematical Lecturer, of Christ's College, Cambridge.—London : Simpkin & Co. 1837. Small 8vo., pp. 310.

ALTHOUGH much has been written on the Highlands, by travellers of various dispositions and capabilities, the subject is by no means exhausted, nor, indeed, we suspect, will it ever be. Besides the ever-interesting scenery and other attractions of the Highlands, the intelligent tourist must find, at almost every step, some things which had previously remained unrecorded, and many others which had been erroneously or partially represented. One of the main objects of such works as Mr. Smith's is to amuse as well as instruct, and if the author succeeds in either of these particulars he has assuredly no right to complain.

Mr. Lesingham Smith is a very pleasant fellow-traveller, and although we were not in his company above a few months, yet we learnt enough of him to discover that he is a very intelligent man, and that his veracity may, in every respect, be relied on. He is an enthusiastic admirer of the Highlands, praising not only the scenery—which all travellers unite in lauding—but also the natives, being highly delighted with their hospitality and simplicity. With regard to this, we ought to observe that our author is one of those individuals who is always at peace with himself and every one else ; he makes due allowances for the faults of others, adapts himself to all tempers, and never picks a quarrel with a person who, notwithstanding a little constitutional warmth of temper, may, if courteously treated, become one of his best friends. Mr. Lessingham Smith is, in fact, exactly fitted for making his way in the world. He would find no difficulty in introducing himself into any circles, and, when known, would be sure to be respected.

Now it is curious to observe what different accounts two travellers

will give of the same country ; in many cases not so much from wilful misrepresentation as from the difference in their own *cerebral organization*. The one will blame every thing and every body, while the other, falling into the opposite extreme, will see precisely the same persons and things in a favourable point of view. Of course the latter state of feeling is beyond comparison the more enviable, and, if into either, into this latter extreme is our traveller often disposed to fall. It cannot be denied that the Highlanders abound in that true politeness springing from benevolence, and though rough in exterior, they are certainly far from wanting in the gentler and nobler faculties of human nature. But, at the same time, we are occasionally inclined to suspect that the reverend tourist's affability may have led him to overlook many faults, both in men and country, and also that his mild deportment may have induced others to conduct themselves more courteously and hospitably towards him than might otherwise have been the case. Be this, however, as it may, the volume, which has afforded us considerable amusement in the perusal, may be considered, on the whole, as forming a correct portraiture of the Highlands. The style is engaging, and the manner of description such as will be calculated to interest all classes of readers. The book appears to consist of notes taken at the end of each day, of course retouched prior to publication.

Previous to presenting our extracts, we must notice one blemish which ought not to be overlooked. It is the misplacement of the commas in numerous places, frequently wholly subverting the sense or turning the passage into nonsense. We would fain have believed that the fault was chargeable to the "printer's devil," but the circumstance occurs far too often to admit of its being accounted for in that way.

The following quotation, though not relating to the Highlands, will interest our readers. Our author is writing at the Argyll Arms, Inverary.

"In the evening I found the coffee-room filled with a very noisy set of people—'a bit Glasgow bodies, awa' on a pleasurin' tour.' There was one solitary man with a weather-stained countenance, who, when I took my seat near him, addressed a few ordinary words to me. I was soon after called away to another table, where tea was placed for me, and the weather-beaten man was again left alone. He seemed so utterly abandoned by his kind, that I could not refrain from speaking to him again ; on which he immediately drew his chair to my table, seeming delighted to have a human being to associate with. He said he was just returned from Canada, where he had been residing for the last four years. The Government he described as being in a very unsettled state, on account of the animosity existing between the English and French population. In their House of Assembly some of the speeches are delivered in French and some in English. He resided within gun-shot of the American frontier, and spoke in no very measured terms of the American character. It is a frequent practice with them, he says, to get into debt upon the Canada side, and then step over the frontier and defy their creditors. Mrs. Trollope's book is very little exaggerated, for they have no manners and no feeling. They speak of attending an execution as 'taking a day's pleasure !' They are utterly selfish, even within the pale of

their own family; and when the cholera raged there, many deserted their own parents and brethren. This disease was so destructive that churchyards were covered with dead bodies, for which neither coffins nor graves could be provided. A friend of his was tossed with other carcases into the general heap, and quicklime was actually strewn over the whole, the poor man being perfectly conscious all the while, but unable to stir: at last he contrived to crawl out, and is now alive and well. Many persons were buried in this horrid and premature way, for the Americans never keep any body for more than a day—a man being good for nothing when he is dead. He told a singular story of three Irishmen, who were seized with cholera when perfectly intoxicated, and were carried in a cart to the sheds erected outside the town for the reception of the sick. The surgeon, who was exhausted with his day's work, said he should not attend to men who had no respect for their own lives; and so having administered medicines to the other patients, he left the Irishmen to their fate. When he returned in the morning, all were dead except the neglected Paddies, who, on seeing the doctor, immediately exclaimed, 'When will your honour be ordering us a drop of drink?' One of the victims of this pestilence was Brandt, the chief of the Huron tribe: he was a fine young man, much beloved by his people, a captain in the English service, and a descendant of that General Johnson who had such great influence with the Indians. He died as much from drinking as from cholera; and it seems that this fatal habit is destroying numbers of the red people.—My new acquaintance stated, that, on arriving at Glasgow, he wished to see three of his friends, who were living there when he left Scotland; but on enquiring he found that they were all under the sod."—p. 15.

Mr. Lesingham Smith is a great stickler for the superiority of the service of the church of England. He does not, however, once hint that that service admits of very considerable improvement. Nor, indeed, is it perhaps to be expected at present that a minister of our church should be desirous of effecting the alterations and abridgments to which we allude. After describing the service of the Presbyterian church of Scotland, he says:—

"Such is the service of the Presbyterian kirk of Scotland. I went to hear it with a predetermination that I would not allow myself to judge hastily or harshly; yet my firm conviction is, that in no single respect whatever can it bear a comparison with the service of the church of England."—p. 19.

The following quotation is amusing. Our tourist is paying off one of his guides, and observes—

"'Here's sixpence a-piece for yourself, and wife, and seven bairns, and sixpence over for *luck*.'

"If I had given him a thousand pounds he could not have been more surprised or more grateful. He looked at the two half-crowns for some time without uttering a word, and then burst out:

"'Ye're a gentleman; a rale gentleman! Give us your hand! I'll be up to carry your luggage the morning for nothing. Thank ye—thank ye kindly.'

"And then, as I turned away towards the inn, he slapped me on the shoulder, and once more exclaimed 'ye're a gentleman!' with a marked emphasis on the word, as if it embodied the highest compliment which one man could pay to another. And the Gael was so far right; but whether giving him a crown proved me to be a gentleman is another matter: I know those who will rather think it proved me to be a fool."—p. 160.

"July 31.—This morning I made a point of attending the Presbyterian service in the choir of the cathedral [at Glasgow]: it differs in no respect from the service of the humblest chapel. The contrast between the simplicity of their religious forms and the splendour of the edifice in which they were assembled was by no means agreeable. O! how I longed to hear the sacred tones of our own majestic organ, and the rich melody of our choristers instead of the meagre notes of one poor clerk and the accompaniment of an unmusical congregation."—p. 180.

Although the outward forms observed in our cathedrals, the absence of which is above regretted, may have an imposing appearance, it may well be questioned how far they tend to inspire devotion in the hearts of the congregation. As regards the sublime harmony of the organ, and the "rich melody of the choristers," we can fully chime in with our author. Music is an important and indispensable part of divine service; but to allow an old drowsy clerk—and what clerks who sing solos in churches are not old and drowsy?—to snarl a psalm-tune through his nose, with the congregation following in his wake (the blind leading the blind!), is in our opinion, both ludicrous and impious.

The journal continues as follows:—

"Another thing which offended my English prejudices especially, was that the men walked into the cathedral with their hats on, and never took them off till they had reached their pews. The moment too that the blessing was ended on went the hats again; as if the place were only sacred while the voice of the pastor echoed along the aisles.

"In the afternoon I went to hear Dr. Wardlaw; his sermon was written and very excellent. What a contrast to the tautological, disjointed harangue of the morning! He belongs not to the kirk of Scotland, but differs, I believe, only in forms, not at all in doctrine. I observed two circumstances in which there was a departure from the rules of the national kirk. The first was, that the congregation stood up to sing, instead of keeping their seats; the second, and much the most important, that a chapter from the Old Testament, and another from the New, were read before the sermon commenced."—p. 181.

The following extract, and especially the sentence we have marked in italics, is a pleasing proof of Mr. L. Smith's enthusiastic admiration of fine scenery:—

"It was the morning of Sunday; but there being no kirk nearer than four miles, and no road to this one except over peat mosses, I resolved to walk to Scourie. The distance is fourteen miles: rather more, perhaps, than a sabbath's journey. But the most rigid disciplinarian would hardly have blamed me for endeavouring to deliver myself from the captivity of Rhiconich.

"It rained, of course; and the clouds were as condescending as ever, stooping far below the summits of the mountains. At one point, however, there was a momentary clearing, and what a glorious landscape did the rising mist unfold! *One glance at such a scene is worth a whole week of sunshine!* A stupendous amphitheatre of mountains surrounded me, where crag frowned over crag and rock was piled on rock, and where the sloping faces of the loftier hills were scored and wrinkled by the channels of ten thousand torrents. More conspicuous than all, the huge geometric cone of the stack arose, the

lingering clouds still rolling fantastically about its dim and spiry peak. Below me, in a vast hollow, lay the dark surface of a loch, dotted with numbers of stony isles, whose grey rocks and blossoming heather stood in beautiful relief over the smooth murkiness of the water."—p. 301.

After noting the joyful appearance of animated nature one clear calm day in September, our author makes the following appropriate reflections, which may serve as a hint to those who would introduce *bills to enforce the better observance of the Sabbath*.

"I never witness a scene like this without wondering at and pitying those gloomy religionists who imagine they do God service by rejecting the blessings which he has spread before them. When I perceive all the inferior animals of creation so busy and so gay, I can never believe that man, the lord of all, will be accounted guilty when joyous, and that he is profitable only when self-tormented; or that he will advance his interests hereafter in proportion as he steels his heart against the sympathies which gladden this life and disregards those prudential cares which may alleviate or remove its ills. Virtue is not only consistent with cheerfulness, but rarely approaches perfection without it; and he best serves his God who provides as largely as he can for his own rational happiness and that of all his fellow creatures."—p. 304.

We shall now present our last extract, for the very good reason that we have got to the end of the book. The journal closes with the ensuing paragraphs, which may be taken as a kind of summary of our author's opinion of the Highlands.

"Throughout this whole excursion I have been singularly unfortunate in weather; owing partly to the late period of my visit, but principally to the extraordinary nature of the season. Yet in spite of circumstances so adverse to enjoyment, and of the consequent solitariness of my rambles, I have derived from them no inconsiderable share of pleasure, information, and health.

"In the Highlands a stormy sky is seldom without its peculiar charms: it throws down upon the wild landscape contrasted light and shade, magnifies objects which are already intrinsically vast, and exhibits the face of Nature in alternate majesty and grace. And when at last the sun shines out with steadfast splendour, its cheering ray seems to light up the innermost chambers of the heart, dispelling all fears and anxieties, and fully reconciling us once more to our position on the globe. We then feel mere animal existence to be a blessing; and in the actual enjoyment of the present hour, cease for a while to hope for the future.

"But whether I met with bright or stormy skies, I never roamed far without encountering scenes of surpassing beauty or of startling grandeur. And sure am I that whoever wanders through this romantic land, will find whatever of poetry or of philosophy his mind may possess awakened and stirred within him. My path, too, was always cheered by the reflection that I was among a race of men who had forgotten the ferocity, but not the hospitality, of their forefathers, and whose urbanity to the stranger called forth my warmest sympathies, and raised in my estimation the standard of humanity. No one could have come among them with less claim to kindness than I had; and no one, surely, could have met with more. I have not set down the half of it; and could still recount many an instance of good will for which I cannot hope to make any return: for, in all human probability, I shall never meet those kind-hearted Highlanders again, and never more loiter among their beautiful glens. All that now lies in my power is to acknowledge my obligations; especially to one worthy family from whom I

experienced the Arab's hospitality and the Samaritan's compassion: and if ever this humble volume should reach a corner of the kingdom so remote as Durness, it is a pleasure to me to reflect that its minister will find the last sentiment recorded here is that of gratitude to him and his, for their generous treatment of a weary stranger."—p. 310.

The volume is adorned with several highly creditable sketches of Highland scenery, &c., apparently from drawings by the author, lithographed by the well-known artists, Messrs. Day and Haghe. We should not be surprised or displeased to find that our notice of Mr. Lesingham Smith's *Journal of a Ramble in Scotland* has caused some of our readers to make themselves further acquainted with its contents, by a perusal of the whole book.

Journal of a Horticultural Tour through Germany, Belgium, and part of France, in the Autumn of 1835; to which is added a Catalogue of the Cactææ in the gardens of Woburn Abbey. By James Forbes, A.L.S., &c. London: Ridgway & Sons. 1837. 8vo., pp. 164.

"THE continental gardens and botanical collections having been rarely visited by the British gardener, his Grace the Duke of Bedford, with his usual anxiety for the promotion of useful knowledge, very liberally and kindly proposed, in the autumn of 1835, that I should undertake a horticultural tour through several parts of Germany, Belgium, and France, with a view of inspecting the different collections and productions cultivated in some of the most celebrated horticultural establishments in these countries."—*Preface*, p. v.

Mr. Forbes accordingly travelled, took his notes, and published them; and as the author is an intelligent man, and evidently tells us his real opinion of what he saw, his observations are both readable and useful. We are, moreover, glad that our author has not considered it beneath his dignity to make a few remarks occasionally on paintings, statues, &c., which proves him to be possessed of a mind both more enlarged and more cultivated than the majority of even head gardeners. Without further noticing the contents of this volume, we shall extract the following conclusions, at which the author has arrived on the objects of his tour.

"Upon the whole, in regard to the general state of Horticulture in the countries which I visited, the following conclusion must be drawn:—The plants in the hot-houses are in most of the establishments kept in excellent order and in a healthy state; the *Succulentæ* also appeared to be much more extensively cultivated than they have hitherto been in England. But the general order and neatness of the grounds (with only a very few exceptions) were but little attended to. Nor did the gardeners appear to me to well understand the forcing of fruits, except in one or two places in France; neither did I perceive that nicety in the training of fruit trees that is thought indispensable in England. Vegetables are, however, in large establishments, more extensively grown; but there certainly did not appear to be such a general spirit for horticultural improvement as is prevailing in this country. At no period was gardening pursued with greater spirit in England than at

this moment; inasmuch that we can scarcely visit a nobleman or gentleman's gardens without observing very extensive improvements and alterations proceeding in every direction. And this we cannot but regard as an indication of application and attachment to rural improvements highly honourable to our nobility and gentry, as superseding many of those pursuits that used to prevail to a great extent with gentlemen residing in the country, which had but little tendency to the improvement of their grounds or estates."—p. 145.

We have only to add that another nobleman has followed the excellent example of the Duke of Bedford, in sending out his gardener to foreign parts on a horticultural tour; and that we hope to see the plan, ere long, extensively adopted.

Account of the late Aëronautical expedition from London to Weilburg, accomplished by Robert Hollond, Esq., Monck Mason, Esq., and Charles Green, Aëronaut. London, 1836. 8vo., pp. 52.

Mr. Monck Mason inscribes his account, in testimony of sincere regard and friendship, to Robert Hollond, his fellow-voyager, to whose liberal and enterprising spirit their expedition owed its origin and success. He then states, introductively, the principal obstacles to the practice of Aërostation, and their removal by the happy exercise of Mr. Green's ingenuity and heroic perseverance.

These impediments, Mr. M. says, consisted in the uncertainty and expense attending the process of inflation of the balloon with hydrogen gas; the dangers considered inseparable from the practice of aerial navigation; the difficulties which hitherto had baffled all attempts to give a direction to the machine; and the impossibility which every previous aëronaut had experienced, of remaining in the air a sufficient time to ensure the attainment of a sufficient distance. To remove these obstacles, and to reduce the aerial vehicle to a more certain issue, a vast extent of actual experience, united to an intellect capable of turning it to account, was absolutely required; and he emphatically declares that to the combination of both these high requisites, in the person of Mr. Charles Green, we are indebted for the entire results of all that is beneficial in the practice, or novel in the theory, of Aërostation—the most delightful and sublime of all sub-lunary enjoyments.

The first of the fore-mentioned impediments was surmounted by Mr. Green's discovery of the applicability of coal-gas to the purposes of inflation. Among other important advantages gained by this discovery, Mr. Monck Mason distinguishes the diminution of expense and risk, and the superior facility wherewith the coal-gas is retained in the balloon, owing to the greater subtlety of the particles of hydrogen, and the strong affinity they exhibit for those of the surrounding atmosphere. In a balloon sufficiently perfect to retain its contents of coal-gas unaltered in quality or amount for the space of six months, an equal quantity of hydrogen gas could not be maintained in equal purity for an equal number of weeks.

With respect to the danger usually considered as liable to occur in the exercise of Aërostation, much is not required, in Mr. M.'s estimation, to prove the fallacy of such fears. Mr. Green's two hundred and twenty-six ascents, undertaken at all periods of the year, without one disappointment to the public, and without one solitary instance of fatal consequences, or even of an accident having disagreeable results, Mr. M. thinks, ought to be a sufficient proof of how little danger is to be apprehended in the practice of Aërostation, when managed by a skilful leader, with the aid of those improvements which Mr. Green's experience originated and successfully applied.

Mr. M. M. abstains from making observations on the state of the aërostatic art, in respect of the power of guiding a balloon according to a given direction; the want of which is said by him to be generally considered as the greatest obstacle to its farther progress, and adaptation to the ordinary purposes of human life. As, however, the discussion of this question would extend to a considerable length, and as it formed no part of the project in pursuance of which the late aërial expedition was undertaken, he reserves the subject for a future and more elaborate investigation.

Mr. Green's previous discoveries are held, by their historian, as yielding in importance to that whereby he has succeeded in enabling the aëronaut to maintain the power of his balloon undiminished during the most protracted voyage he may be required to perform. Mr. Monk Mason describes this highly-appreciated discovery in the following terms :—

“ In order fully to comprehend the value of this discovery, it is necessary that some idea should be had of the difficulties the late enterprize was intended to obviate, and of the effects they were calculated to produce upon the farther progress of Aërostation. When a balloon ascends to navigate the atmosphere, independent of a loss of power occasioned by its own imperfections, an incessant waste of its resources in gas and ballast becomes the inevitable consequence of its situation. No sooner has it quitted the earth than it is immediately subjected to the influence of a variety of circumstances tending to create a difference in its weight; augmenting or diminishing, as the case may be, the power by the means of which it is supported. The deposition or evaporation of humidity to the extent, in proportion to its size, of several hundred weight; the alternate heating and cooling of its gaseous contents by the remotion or interposition of clouds between the object itself and the influence of the solar rays, with a variety of other more secret, though not less powerful agencies, all so combine to destroy the equilibrium which it is the main object of the aëronaut to preserve, that scarcely a moment passes without some call for his interposition, either to check the descent of the balloon by the rejection of ballast, or to control its ascent by the proportionate discharge of gas; a process by which the whole power of the balloon, however great its dimensions, must in time be exhausted, and sooner or later terminate its career by succumbing to the laws of terrestrial gravitation. By the simple contrivance of a rope of the requisite magnitude and extent trailing on the ground beneath, (and if over the sea, with a sufficient quantity of liquid ballast contained in vessels floating on its surface), have all these difficulties been overcome, and all the features of the art completely and effectually reversed. Harnessed to the earth or ocean by a power too great for her to resist, it is in vain the balloon endeavours to change

the level of her onward course: every foot she would have been otherwise compelled to add to her elevation now only adds to her weight by her endeavours to abstract from the earth a further portion of that rope which is dependent upon its surface; while, on the other hand, every foot she would have been inclined to descend, had she been at liberty as heretofore, now only abstracts from the weight which draws her downward, by throwing on the earth the labour of supporting an additional portion of the guide-rope, which she would otherwise have had to sustain without relief. Limited to one unalterable plane, all the fluctuations above mentioned, whereby her irreparable stock of power became incessant waste, have thus completely been avoided, and not only her ascensive force maintained in its full vigour throughout a period determinable solely by her own imperfections, but at all times and under all circumstances; over the boundless ocean, without a landmark, in the densest fog, and throughout the darkest night, the exact direction of her course, as well as the very rate of her progress, determined with the utmost facility and most infallible results.

"The progress of the guide-rope being delayed to a certain extent by its motion over the more solid plane of the earth's surface, while the movement of the balloon is as freely as ever controlled by the propelling action of the wind, it is evident that the direction of the latter when in progress must ever be in advance of the former; a comparison, therefore, of the relative positions of these two objects by means of the compass, must at all times indicate the exact direction of her course; while, with equal certainty, an estimate can at once be obtained of the velocity with which she is proceeding, by observing the angle formed by the guide-rope and the vertical axis of the machine. In proportion as this angle enlarges, an increase in the rate of the balloon may be infallibly inferred, and, *vice versa*, its diminution will be found to correspond exactly with the diminished velocity of her advance. When the rope is dependent perpendicularly, no angle of course is formed, and the machine may be considered perfectly stationary, or at least endowed with a rate of motion too insignificant to be either appreciable or important.

"The main feature, however, in this discovery, is the altered aspect under which it enables the aéronaut to regard the perils of the sea, and the consequent extension it bestows upon the hitherto limited sphere of his relations. The ocean, now no longer the dreaded enemy of the aerial voyager, becomes at once his greatest friend, and instead of opposing his progress, it offers him advantages more certain and efficacious than even the earth itself with all its presumed security is calculated to contribute."

Appended, in a foot-note to page 22 of Mr. M's. history, is an observation which deserves to be received as both new and curious. He represents it as a fact, that the sea, unless *perhaps* under circumstances of the most extraordinary agitation, does not in itself appear to be the parent of the slightest sound. Unopposed by any material obstacle, an awful stillness seems to reign over its motions. Neither is it probable he thinks, that even under *any* circumstances, no matter how violent, can any considerable disturbance arise from the conflict of its own opposing members. The impossibility of ever having been placed in a situation to bring this fact under the cognizance of our senses, is no doubt the reason why it has never before been noticed. On the shore or in the sea, no one has ever been present independent of that material support the absence of which is necessary to the success of the experiment: it is in the balloon alone, Mr. M. exultingly avers, that such a phenomenon could either have been verified or observed.

During the night of their adventurous journey, the *aéronaute*s perceived the cold to be very intense, the thermometer ranging variously from within a few degrees below to the point of congelation. Their supplies of water, coffee, and oil were completely frozen in their several vessels. Strange, however, as the statement may appear, Mr. Monck Mason observes, while all around bore unequivocal testimony to the severity of the cold, the effects produced upon their persons, although undefended by any extraordinary precaution, were by no means commensurate to the cause, nor such as even, under ordinary circumstances, the party might fairly have expected to encounter. This unusual exemption from the consequences of a low temperature is ascribed by Mr. M. to the absence of all current of air, the natural result of their situation, and one of the peculiar characteristics of *aërial* navigation. To this intensity of cold, preceded by a long subjection to the action of a humid atmosphere, he likewise attributes the occurrence of an incident which merits particularly to be noticed. It is thus in Mr. M's. own words:—

"It was about half-past three in the morning when the balloon, having gained a sudden accession of power, owing to a discharge of ballast, began to rise with considerable rapidity, and ere we had taken the customary means to check her ascent, had already attained an elevation of upwards of twelve thousand feet. At this moment, while all around is impenetrable darkness and stillness, an unusual explosion issues from the machine above, followed instantaneously by a violent rustling of the silk and all the signs which may be supposed to accompany the bursting of the balloon in a region where nothing but itself exists to give occasion to such awful and unnatural disturbance. In the same instant the car, as if suddenly detached from its hold, becomes subjected to a violent concussion, and appears at once to be in the act of sinking with all its contents into the dark abyss below. A second and a third explosion follow in quick succession, accompanied by a recurrence of the same astounding effects; leaving not a doubt upon the mind of the unconscious voyager of the fate which nothing now appears capable of averting. In a moment after, all is tranquil and serene: the balloon has recovered her usual form and stillness, and nothing appears to designate the unnatural agitation to which she had been so lately and unaccountably subjected. The occurrence of this phenomenon, however strange it may appear, is nevertheless susceptible of the simplest resolution, and consists in the tendency to enlargement from remotion of pressure which the balloon experiences in rising from a low to a higher position in the atmosphere, and the resistance to this enlargement occasioned by the net-work, previously saturated with moisture and subsequently congealed into the elliptical form which the dependent weight of the car obliges it to assume whenever the shrunken capacity of the sphere it encompasses will admit of its longitudinal distension. As this resistance is occasioned by the intervention of a *non-elastic* medium—the ice—which has bound the meshes of the net-work in their contracted form, it is evident that the liberation occasioned by their disruption will not take place until the internal pressure of the balloon has reached a certain amount, and then suddenly that liberation is accomplished, attended by those collateral effects which have already been described. The impression of the descent of the car, in the above representation, is evidently a false one: the car, so far from sinking, actually springs up: it is the unexpectedness of such a movement, and its apparent inconsistency with the laws of gravitation, that occasions the delusion, the reality of which the concomitant circumstances essentially tend to confirm."

Towards the conclusion of his sketches Mr. Monck Mason communicates a fact which merits much consideration, from its bearing upon an essential principle in Physiology. He affirms that, although he and his intelligent companions frequently rose to an elevation of above twelve thousand feet, occasionally higher, yet at no time did they experience the *slightest* effect upon their bodies, proceeding from the diminished pressure of the atmosphere. Nor, from their observations, does he believe that any such effects as are currently attributed to this diminished pressure have any actual existence, at least at any elevation to which any person has hitherto been enabled to arrive. He concludes, also, that the impressions experienced in the ascent of high mountains owe their effect to another cause, and proceed from the inordinate muscular exertion and its consequences upon the circulating system, and, he might have added, from the great exhaustion of vital energy which every laborious effort of this kind must necessarily produce.

The three intrepid aeronauts started on their adventurous expedition from Vauxhall Gardens, at one o'clock, p.m., of Monday, the 7th of November, 1836; and having traversed five hundred miles, over the land and the sea, completed an unparalleled journey at Weilburg, in Nassau, after remaining for eighteen hours suspended, in their cloud-compelling flight, between earth and heaven.

A History of British Birds, indigenous and migratory: including their Organization, Habits, and Relations; Remarks on Classification and Nomenclature, &c. Illustrated by Engravings. By Wm. MacGillivray, A.M., F.R.S.E., M.W.S., &c. Vol. I. London: Scott, Webster, and Geary. 1837. 8vo., pp. 631.

THERE are not persons wanting, even among the ranks of practical ornithologists, who will view with apathy and even with disgust this new attempt at a history of our native Ornithology; not that they either distrust the ability of the new candidate to their favour, or believe the subject he treats to be exhausted. True, the works already published on British Ornithology are both numerous and excellent, a proposition which we need only support by mentioning the names of Pennant, Montagu, Selby, and Mudie. Others have also published a host of works on the same subject, as Lewin, Graves, Albin, Donovan, Atkinson, Meyer; and various monographs have been issued by Bolton, Syme, Nash, &c. The greater part of these publications are, however, of little or no use; and although the volumes of Montagu and Selby are still classical authorities, we consider that as long as our native birds continue to be interesting to the ornithologists of this country, so long new British ornithologies must and will continue to appear at intervals. It is obvious that only a few are able competently to perform such a task. Those authors who engage in the work without being fit to carry it through will soon sink into merited oblivion; but those, on the contrary, who possess the requisite knowledge and ability, can-

not fail to benefit science by directing their labours to such an object. This being the case, it only remains to consider the plan and character of the work before us, of which only the first volume is at present vouchsafed to the public.

There is one feature in Mr. MacGillivray's book which, in our opinion, places it above all others on the same subject that have fallen under our notice; we allude to the observations on the internal structure of birds, minute particulars being given, not only of the class, but of each species. By preceding British ornithologists anatomy has been undeservedly neglected, their observations on this topic being, in general, few and meagre. Some continental naturalists, on the other hand, have erred in the opposite extreme, and conferred an undue importance on internal organization as a guide to classification. Cuvier's *Règne Animal* may be adduced as a striking instance of this, and also, we must add, the present *History* of Mr. MacGillivray. The system of the latter author does not differ materially from those propounded by various other writers, and long since exploded; and although he occasionally indulges in ridicule at the incongruities presented, according to his ideas, by quinary and other systematists, yet what can we say to his classing the Bee-eaters with the Swallows and Goatsuckers, and the Dippers with the Kingfishers? In so far as the three first-named genera may all be termed Volitatores, they unquestionably agree, and for ought we know to the contrary the internal structure may countenance the arrangement; but, taking all circumstances together, it cannot be considered otherwise than unnatural. As regards the Dipper (*Cinclus*), its relationship to the *Turdidæ*, but more especially to the Ouzels, and most of all to the Garden Ouzel (*Merula hortensis*), is so striking and obvious that we cannot but wonder at their separation by our author. The Garden Ouzel, though not partial to rocky streams, is a great lover of water; and we have seen the young of this species, before the tail was fully grown, so like the Dipper in form, colour, and habits, that a very slight stretch of the imagination might have converted the one species into the other. The tail of the Garden Ouzel, both old and young, is often cocked up in the manner of the Dipper, and the white breast of the latter—which, in a somewhat different shape, is found in the Ring Ouzel—appears to be alone wanting to render the illusion complete. It has been the common fault of nearly every author who has tried his hand at system-making to attend too exclusively to the one particular part of a bird which he considers most important for his purpose. Thus, Linneus fixed upon the bill, Vieillot the claws, Cuvier the internal organs, and so on. Tolerable classifications may be, and have been, formed from these and other characters taken separately; but we conceive that, to obtain anything like a "natural system," every part of the bird, both external and internal, must be examined. In our opinion the internal structure, taken alone, affords even a less eligible foundation for a system than an exclusive attention to the outward organs; and certainly if the classification of Mr. Mac-

Gillivray is sufficiently ably executed to afford a test of the truth of our position, we should say that the attempt to systematize according to the inward parts is a failure.

We have mentioned instances of what appear to us gross errors in our author's classification of the larger groups of birds. As regards the extent of his genera, he has almost invariably followed the most approved modern ornithologists, and in the one case in which he has deviated from these authorities it is probable few will be found to agree with him. We allude to the circumstance of his having placed the Green Grosbeak (*Coccothraustes chloris*) in the genus *Linaria*, because, says the author, the bill is not sufficiently thick and large in proportion to the size of the bird to entitle it to the rank of the Grosbeak. Now it so happens that in this, as in other instances, figures of the head and bill of the Haw Grosbeak and the Green Grosbeak are supplied. To these, the author triumphantly refers his readers as proofs of the justness of his views. But, unfortunately, the cut of the Green Grosbeak's head and bill is anything but correct; the latter is much too small, and we believe no ornithologist would recognize the familiar physiognomy of *C. chloris* in the drawing presented to him. The latter species unquestionably stands between the Haw Grosbeak and the Linnets, but few, we believe, will doubt that it is much more nearly allied to the Grosbeaks than to the Linnets. In making these strictures we ought, perhaps, to notice that our author does "not profess to add a new system to the many already in partial use," but "merely to disclose the order which I conceive to be best adapted for the present work." Still, whether or not he wishes that order to be followed by others, it must be and is a new system, as far as we understand the import of the word.

On the subject of nomenclature our author is not over eloquent, but he stands up for the necessity of giving *classical* scientific names, and holds that generic names should be of Greek, and specific of Latin, origin.* The former rule is important as regards the names of new birds, the latter we consider of no practical value.

As the subject of English nomenclature has of late attracted so much notice, the opinion of Mr. MacGillivray on that department may not be without interest.

"As to English names, very little needs be said, further than that were the genera positively fixed, which they cannot be for many years, if ever, it might be well to give them vernacular names, in which case each species ought to have a distinctive epithet or substantive name. Thus, we shall suppose a genus named *Corvus*, to consist of five species, named *corax*, *corone*, *cornix*, *frugilegus*, *monedula*. The English generic name being Crow, we might name the species Raven Crow, Carrion Crow, Hooded Crow, Rook Crow, Daw Crow. But in all cases single substantive names would be the best: for example, the Raven, the Corby, the Hoody, the Rook, the Daw. Some persons propose a general meeting of British ornithologists at London, York, or Edinburgh, for the purpose of determining the English nomencla-

* See *The Naturalist*, vol. ii., p. 150.

ture of our native birds; but such a meeting, were it to take place, would disperse without accomplishing the object in view, unless indeed its members were placed on the Bass Rock, and interdicted fire and food until they had settled all their differences, and sworn perpetual friendship. Even then, some malicious Celt, capable of subsisting a month on dulse and tangles, with an occasional raw Limpet or Mussel, might hold out until, rather than be starved, the philosophers should leave the birds to him to do with them as he pleased. In sober earnest, it is impossible to remedy the acknowledged defects in nomenclature, so as to render it universally acceptable. Some persons who do their best to render the subject still more intricate, are extremely sensitive on the point of uniformity; but, in my opinion, however much they who are abitious of being legialators in this matter may desire conformity to their views, there will always be more to spurn the yoke than to yield to authority, which is gradually falling to its proper standard. In fact, no two ornithologists have ever used the same names for five hundred birds; nor could two be found who should employ the same nomenclature in describing even the birds of Britain. There is really no cause of regret in all this: were there no differences in politics, religion, and science, the world would probably be much worse than it is. I am therefore under the necessity of using my own discretion in bestowing English, Gaelic, and Latin names on the birds which I propose to describe; and I request that my readers scruple not to reject whatever they find indicative of bad taste or bad feeling."—p. 10.

This being the opinion of our author, the reader would certainly be but ill prepared to meet with the following passage, which we are at a loss to reconcile with the above observations.

A reason may here be assigned for altering the common name of this bird (the Red Grouse). The English name of *Tetrao* being Grouse, and that of *Lagopus* being Ptarmigan, it is obviously improper to bestow the appellation of Red Grouse on a species of the latter genus. But it may be said, the distinctive 'Red' ought to be retained. I think not. *Lagopus saliceti* is more properly red, *L. Scoticus* is more brown than red, *L. cinerius* is grey in autumn, *L. rupestris* yellow in summer, and *L. leucurus* has a white tail, in which respect it differs from all the rest. Therefore I name these birds—*L. saliceti*, Red Ptarmigan; *L. Scoticus*, Brown Ptarmigan; *L. cinerius*, Grey Ptarmigan; *L. rupestris*, Yellow or Rock Ptarmigan; and *L. leucurus*, White-tailed Ptarmigan."

We should not have been sorry had similar reasoning been carried throughout the volume; but as this has not been done, part of the above passage appears somewhat out of place. In a few instances we find Latin names altered where the former designations were considered faulty. In one case, however, the change seems unnecessary; we allude to *Coccothraustes atrogularis* being substituted for *C. vulgaris*, while a name, in our opinion, equally good with the former already existed, namely, *C. cratægus*, Blyth.

At page 7 a sneer is indulged at the doctrine of analogies of Mr. Swainson, which appears to us much less ridiculous than Mr. MacGillivray would have us believe. Every one admits the more striking analogies between animals of different classes, but those which are less obvious of course require much more study than can be devoted to them by every one.

We have expressed partial disapprobation both at the system and

the nomenclature of the work under review, but fortunately the book contains much that fully atones for any trifling delinquencies in those departments; and if it has been found difficult to add much new matter relating to *habits*, the descriptions, being for the most part original and accurate, will be perused with considerable interest. The sections on the external and internal anatomy of the class are evidently written by one perfectly versed in the task he has undertaken. These chapters are illustrated, in a very superior manner, by numerous engravings, executed from drawings by the author.

Mr. MacGillivray reprobates, and with justice, the inattention of ornithologists to the internal anatomy of birds; and if we are not disposed to place so much confidence in it as a basis of classification as we find our author doing, we may at least agree with him in regretting the occurrence of such errors as the following, appearing, too, under the auspices of undoubtedly one of the first zoologists of the day. After describing the osseous system of birds, he says:—

“This superficial inspection of the osseous parts of birds will suffice to render the relations of the external parts intelligible, and prevent the student of Ornithology from falling into those strange mistakes to which persons are liable whose knowledge is not more than skin deep. I may be allowed to adduce a few examples from the *Natural History and Classification of Birds*, by William Swainson, Esq. ‘The leg,’ he says, ‘is obviously divided into three parts: 1. The thigh; 2. The shank or tarsus; and 3. The foot itself, composed of the toes. The thigh is subject to very few variations beyond relative length, and in being more or less clothed with feathers. In aquatic birds it is generally naked before it reaches the knee-joint.’ Never, in any aquatic bird, is the thigh naked; but it is obvious that Mr. Swainson is not aware that birds have a thigh. Again, ‘the humerus [referring to the extremity of the cubitus] is generally termed the shoulder; the *scapulum* [pointing to the wrist] is the shoulder joint; and the *axilla* [reference to the pollex] which corresponds to the *cubitus*, is commonly called the shoulder margin.’ To mistake the wrist joint for the shoulder joint is a blunder which might have been avoided by inspecting a skeleton, or even feeling for the bones in the wing of any common bird.”—p. 33.

Our author believes that

“It is very doubtful whether the sense of smell be acute in any order of birds; for it has been most satisfactorily proved by Mr. Audubon that in the Vultures, at least in those of the genus *Cathartes* that occur in North America, which were supposed to possess it in the greatest perfection, it is so inefficient as not to indicate to them the existence of putrid flesh in their immediate vicinity.”—p. 51.

For an interesting instance in which some Crows were unquestionably directed to carrion by the sense of smell alone, we refer our readers to *The Naturalist*, vol. ii., p. 34.

In the account of the Red Grouse (*Lagopus Britannicus*) occurs an animated description of an adventure of the author's, in returning from a botanical excursion through the Hebrides and the south

of Scotland. This we had marked for extract, but regret our inability to graft it upon our pages, on account of its length.

"I object," says Mr. M'G., "to the specific name *mutus*, given to the Grey Ptarmigan, that the bird is not mute; and to *albus*, that the Willow Ptarmigan is equally white in winter. The latter species is in summer the only one of the three that is red, and therefore I would name it the Red Ptarmigan; while the species commonly called the Red Grouse, being less red than that just mentioned, and presenting a brown mottled appearance, might be named the Brown Ptarmigan; and the present species, being the only one that is at any time grey, ought therefore to be called the Grey Ptarmigan."—p. 210.

It is to us pleasing to find that our author is not inclined implicitly to adhere on all occasions to the names imposed by his predecessors. But it is good to observe moderation in all things, and in nothing is it more required than in the nomenclature of so extensive a field as Natural History. We are decidedly for expunging glaringly erroneous names from our catalogues; but as we conceive it vain to attempt to obtain unexceptionable designations, either for genera or species, in ninety-nine cases out of a hundred, it certainly is to be regretted when authors alter established names on slight grounds. We perceive no tenable objection to Red Grouse as applied to *Lagopus Britannicus*, and must protest against the changes suggested in the foregoing extract.

Our author has some pleasant chapters in his book entitled "Practical Ornithology, in the style of a Dialogue." In one of these we find the following passage. After mentioning the best methods of killing such birds as are not mortally wounded by the shot, his supposed companion says:—

"It is a barbarous business this practical Ornithology of yours, and one not well adapted for benevolent persons.

"Say not so; a surgeon is not necessarily a savage. Ladies indeed cannot become practical ornithologists, although they make no scruples in spitting insects; nor, I believe, Quakers, who, although they will not kill Cows, yet eat beef. I cannot account for these inconsistencies. Botany is the best study for ladies and other gentle beings; and Geology for the stout-hearted rough-shod gentlemen who do not choose to stick Beetles on pieces of cork, or fumble among piles of paper for dry blades. For my part I have tried them all; but the study of birds and quadrupeds, with the aid of powder and shot, is that which I prefer: and I know few occupations more delightful than that of poring over the entrails of a rare bird until you have satisfied yourself as to some minute points of structure."—p. 241.

In a subsequent page our author and his ideal companion chime in with each other, as might be supposed, very pleasantly as regards the doctrine of analogies. Ridicule can, however, never prove the doctrine to be ridiculous.

We admit, with Mr. Mac Gillivray, that the *Columbidæ*, as a whole, form a very natural and distinct group. Still it must be remembered that there exist species which it is really difficult to determine whether they rank properly in this or the neighbouring

division. As regards the name "Stock Pigeon," we think it highly improbable that the name was given on account of that species being supposed to be the original of the dove-cot race; it has been supposed to be rather from the fact of the bird building in the stunted trees termed "stocks."

The following passage is a good hint for those naturalists who when they meet with any bird at large in this country, no matter whether a Parrot or a Finch, a Honeysucker or a Wren, confidently add it to the British fauna:—

"These [*Columba palumbus*, *C. anas*, *C. livia*, and *C. turtur*] are all the Pigeons that have any claims upon our consideration. An individual of the American Passenger Pigeon, *Ectopistes migratoria*, is recorded by Dr. Fleming, as having been shot in December, 1826, in the neighbourhood of a Pigeon-house at Westhall, in the parish of Monymenal, Fifeshire. The feathers, according to the describer of this specimen, 'were quite fresh and entire, like those of a wild bird.' Why not? If it had escaped from confinement and resided in a dovecot for half a year, it might have its plumage as neat as that of any other bird. Such a circumstance affords no criterion. A beautiful specimen of the Dominican Grosbeak, *Loria Dominicana*, in perfect plumage, was sent to me fresh in the winter of 1831. It had been shot somewhere near Dalkeith, and I made a drawing of it for my collection of British birds; but soon after it was reported to have escaped from Lady Dalhousie's aviary. In June, 1835, a lovely little bird, fresh and with perfect plumage, was brought to me from Braid Hermitage, near Edinburgh, where it had been shot when in company with another of the same species, supposed to be the female. It turned out to be the *Loria astrilda*. Its skin forms a part of my collection; but I should no more think of assigning this species a place among British birds than of admitting the Migratory Pigeon. Yet its claims are certainly equal, for its feathers 'were quite fresh and entire, like those of a wild bird,' and remain so to the present day."—p. 294.

At page 331 it is observed that albino individuals of the Chaff Finch sometimes occur, although the author has not met with a British one. We have never seen one quite white, but we once possessed a very curious specimen with as much of white as any other colour. The individual alluded to appeared above the usual size, though this was probably only an error of the stuffer. By the way, this reminds us of an observation of our author's which the student will do well to keep in mind:—

"As to a difference in size observed by persons visiting museums, I have only to remark, what every collector must know, that two birds of equal size prepared either as skins or as stuffed specimens by two individuals, may differ exceedingly in size. I knew a bird-stuffer who, in preparing Grouse, crammed them to the utmost, to make them look like large birds; and a person who has collected about a hundred skins of British birds for me, has almost invariably made them much too short."—p. 210.

In the description of the House Sparrow our author alludes to what Mr. Neville Wood says relative to the supposed familiarity of the species, and agrees with the common opinion in this respect. We must, however, observe that the House Sparrow is remarkably distrustful of man considering that it lives so much in the neigh-

bourhood of our dwellings ; and that it is much less approachable at any time—but more especially when it is abroad in the fields—than the Chaff Finch, Hedge Dunnock, Robin Redbreast, and various other birds of its size, we think almost every one will admit.—We wonder when the question as to the type of the *Fringillidæ* will be settled. Some consider it to be the Haw Grosbeak, others the Siskin Goldwing, others—with more propriety, we think—the Chaff Finch, and Mr. MacGillivray has added to the confusion by raising the House Sparrow to this important station.

If Mr. Swainson's reasoning relative to the *weakness* (!) of the Haw Grosbeak's bill is "a remarkable instance of false reasoning," we are not a whit the less disposed to blame our present author for *his* reason for separating the Haw and Green Grosbeak, but of this we have already said enough. It may here be interesting to notice, as there has been much disputing about the food of the Hedge Coal-hood (*Pyrrhula pileata*, MacGill.), that our author thinks, "judging from the structure of its digestive organs, that such crude vegetable matters as buds could not afford it sufficient nourishment."

Our author is of opinion that Ravens and other carrion birds discover the existence of putrid food at great distances rather by the mode of flight and general behaviour of their neighbours than by their own sense of smell ; and the supposition is at least plausible.

In the biography of the Carrion Crow an interesting account of the destructive propensities of this bird in the lambing season is inserted, from the pen of Mr. W. Hogg, shepherd, Stobo Hope, Peeblesshire, which we intended to have quoted had space permitted. Another letter, from Thomas Durham Weir, Esq., Boghead, Linlithgowshire, relating to the same species, is likewise supplied, which, for a similar reason, we must pass over.

If we may be allowed to judge by the following passage, our author has not attempted to discover the dispositions of birds by the development of their crania, which, however, the extensive collections to which he has access would give him ample opportunities for doing :—

"If the brains of birds are capable of being mapped, certainly the parish of Acquisitiveness ought to be remarkably large in these species [the Crows], as well as those of Cautiousness and Prudence [these two faculties are synonymous], for the dread of man in birds unable to cope with him is evidently not cowardice, but a reasonable and estimable feeling."—p. 558.

Mr. MacGillivray, we regret to say, is here beyond his depth. From what, we would ask, can cowardice proceed but the organ of Caution ? and in that truly we can perceive nothing particularly "reasonable and estimable."

To sum up the merits and defects of the work before us : We are much pleased with the plan on which the descriptions of plumage, &c., are given, viz., a general and concise character of each species at first, with a full and detailed account afterwards. Thus it will, in general, be sufficient to read the former when perus-

ing the work, and omit the rest, as often tedious and uninteresting; but the full details will prove extremely useful, in many cases, in determining species where the distinguishing characters are few and intricate. The habits are related in a plain and unassuming but engaging manner; the anatomical particulars form a new and valuable feature of the book; and the principal synonyms are supplied at the head of each article. The engravings on wood and steel, for the most part, fully equal the expectations we had formed in this particular from the excellent drawings we have elsewhere seen from the pencil of Mr. MacGillivray. We regret, however, to notice that in many cases the wood-cuts of the heads—in our opinion, the most important illustrations in the work—are not executed with that exactitude which we could have desired. Many of them are good, several indifferent, but certainly, we must own, none very bad, if we except the head and bill of the Green Grosbeak, to which we have already alluded. In short, we only desiderate figures of the *entire* birds. It may be replied that these may be had in the works of Bewick and half a dozen other authors. But we should wish every work that is issued on British Ornithology to be as complete as possible in itself, in order that students whose means will not permit their purchasing more than one work on each department of Natural History may not be disappointed when they have made their selection, as it must be obvious that good figures, either coloured or plain, are far preferable to the most elaborate description.

We shall feel much pleasure in laying before our readers some account of the continuation of this work when published, and feel assured that our author will not blame us for giving our opinion of his first volume so freely and unreservedly.

Memorials of Shrewsbury; being a concise Description of the Town and its Environs, adapted as a general Guide for the Information of Visitors and Residents. By Henry Pidgeon. Shrewsbury: Eddowes. 1837. Sm. 8vo., pp. 225.

Shrewsbury is an interesting and important old town, and Mr. Pidgeon has treated his subject in such a manner as to render it acceptable to all classes of readers. The prevailing fault of the majority of our county and city memorials is their extreme dryness, which prevents their being of the slightest value to any but the learned few. The various topics contained in this neat little volume are, the situation, foundation, and etymology of Shrewsbury; its ancient history; castle and feudal state; present state of the town; ecclesiastical buildings; Royal Free Grammar School; local governments, charters, &c.; public buildings; charitable institutions; charity schools; walks within and without the walls; literary and scientific institutions; recreations; suburbs; Castle Foregate; Abbey Foregate; trade and manufactures; environs.

We are much pleased with both letter-press and illustrations;

the latter are numerous and highly creditable to the respective artists. We may bestow especial praise on the chapter dedicated to the ecclesiastical buildings, which will be alike interesting to the architect and the general reader. We could, however, have wished—as such minute attention is paid to the interior of the churches—that the accounts of the organs had been more detailed. The epithets “large,” “small,” “excellent,” &c., as applied to this noble instrument, give the musician a most meagre and unsatisfactory idea of the quality of the various organs alluded to. Perhaps nine writers out of ten would not have condescended to bestow even so many words on this subject as Mr. Pidgeon has done; but surely it is as deserving of the attention of the reader as the church bells! Of course no “true Salopian” will lack this volume on his shelf; and even those who are not residents in this “favoured county” may find much to interest them in the *Memorials of Shrewsbury*.

Last Lecture of the Season, delivered in the Literary and Scientific Institution at Staines, on Friday, June 30, 1837. By the Rev. Robert Jones, D.D., M.R.S.L., &c. London: Hatchard and Son. pp. 32.

DR. JONES possesses an untiring ardour in the grand cause of knowledge, as disseminated by provincial literary and scientific institutions, which, adequately conducted, cannot be valued too highly. Dr. Jones appears to think that a monthly journal devoted entirely to reports and transactions of provincial societies, similar to that of Staines, might advantageously be started. Were such a periodical set on foot, no one would be better qualified to preside over it than Dr. J.; but we feel convinced it could not answer. In the first place, those connected with the various establishments can alone be expected to take much interest in their transactions; and, secondly, the members would peruse the work in their own institution, without themselves taking it in. The same cause acts as a drag on the circulation of even *The Analyst* in many places, though, as our readers are aware, we have ever felt the warmest interest in the success of those very institutions which are in some measure detrimental to our interests. But, with Dr. Jones, we feel convinced of the immense importance of the Societies now everywhere arising around us, and shall, therefore, at all times consider it our duty and our pleasure to further their objects. The lecture before us is remarkable for elegance of style, soundness of thought, and liberality of sentiment.

A History of British Birds. By William Yarrell, F.L.S., Sec. Z.S. London: John Van Voorst. Part I. July, 1837. 8vo. and Royal 8vo.

THIS work is a continuation of the series commenced by the *British Fishes* of the same author, and the *British Quadrupeds* of

Bell. If, on account of the numerous and excellent works already published on native Ornithology, this work is less valuable than its predecessors, it by no means yields to them in its general character and execution. The principal characteristics of this publication are the extreme beauty of the woodcuts, the accuracy of the descriptions, the beauty of the "getting up," and the cheapness of the publication, which will come within the means of every student. We must not dismiss the first part without observing that the style of the wood-cuts has never been equalled, and that those of Bewick really look quite *coarse* after them, although we still consider the illustrations of the latter artist as valuable as when they were first laid before the admiring public.

Supplement to the Flora Metropolitana; or, Botanical Rambles within Thirty Miles of London. By Daniel Cooper, A.L.S. London: Highley. 1837.

EVERY subscriber to the *Flora Metropolitana* will of course procure the present *Supplement* to the work, which appears to be well-digested, and, as far as we have had an opportunity of judging, accurate.

FINE ARTS.

MUSIC.—VOCAL.

An Evening Service, and a Hundred Antiphonal Chants, with Remarks. By the Rev. W. H. Havergal, A.M. Paine & Hopkins, 69, Cornhill.

The Gresham Prize Composition, No. 6. By the same. J. A. Novello, 69, Dean-street, Soho.

To assist in raising the thoughts and affections to the supreme being, and, through the medium of the higher faculties, to increase our veneration for, and, as it were, to bring us into closer affinity with, him in whom we live, and move, and have our being, is the object of sacred music. As an instrument of improvement to the human race, its influence is undoubtedly great; great in proportion to the power with which it stimulates into healthful activity those faculties through which we instinctively recognize the existence of an eternal all-creative mind, and adore that mind when recognized. Who that has listened to the solemn roll of the pealing organ, re-

verberating through the holy aisles of some time-honoured edifice, or, perchance, to the swelling chorus of voices united in fitting praise and adoration of the Almighty, but has felt that he is better, we will even say greater, after what he has heard? High, then, is the rank which we award to sacred music; and noble, nay divine, is the mind which can exert such blessed influence on others, and, in defiance of the lapse of time and the change of fashions, be the instrument of solace, of happiness, and of improvement, to the generations of men for ever. But there is a spurious kind of sacred music, sacred in nothing but its subject; music grave without sublimity, frivolous without ornament. Minims and semibreves are the staple of this style; under them does solemn dullness seek and too often find shelter. Absence of all idea is its characteristic, correctness (if that can be called correct which so lamentably fails of its end) its only recommendation.

As a specimen of this falsely-called sacred music, the compositions before us are every way qualified to stand. Correct without genius, grave without grandeur, scarce a single sentiment of veneration are they calculated to excite, even in minds the most predisposed.

The chants are good, and the idea of varying the chant according to the character of the psalm excellent. Many an obvious absurdity (such as singing a joyful chant to a psalm of a mournful character) would thus be avoided.

Burn not, thou Taper, too intensely bright. The words by Sir Thomas Lawrence, the music composed by William Thorold Wood. T. Boosey & Co., 28, Holles-street.

IN our January number we noticed with approbation some of the earlier productions of this composer. The characteristic of these was tenderness and simplicity. The song before us is of a more ambitious character. This is as it should be; the artist is never to stand still, or even to flag, in the search after ideal perfection. And truly delightful has it been to us to meet with the production of an amateur (as we know the author to be) which gives evidence of research into, and acquaintance with, the mysteries of art. This song belongs to that class of vocal music which aims at producing a perfect whole by bestowing equal attention on all the parts; which regards the accompaniment as an essential feature of the musical picture, as a means of strengthening and prolonging in the mind the emotions excited by the poetry and the vocal melody. Such is the principle which, carried into practice, has enabled the German school to outstrip its once invincible Italian rivals. It is needless to add that the combination of many melodies is a higher branch of the art than that which, neglecting the accompaniment, bestows exclusive attention on the vocal melody. A child, a peasant, may invent a pleasing melody, and any one who has studied Hamilton's *Catechism of Thorough Bass* may indite an accompaniment to match; but how wide is the interval between such patch-work and the simplest song

Mozart ever wrote! The mental exertion required in order to create, or even to understand, a whole is greater than the effort necessary to produce or comprehend a fragment. For this reason do the generality of composers, as well as listeners, prefer that which, although yielding but little credit, and gratification only faint and fleeting, requires neither high genius nor any noticeable expenditure of the "midnight oil" in its cultivation. When, therefore, a composer makes choice of the narrow and steep path which, though not destitute of thorns, will, if diligently trodden, procure him a place among those whose names pass not away with their own generation, it is the duty of those who guard the portals of cotemporary criticism to hold out to him every encouragement to disregard the fickle breath of popular applause, and to hold steadily onward in the search after ideal beauty. With this view we cordially recommend Mr. Wood's song to our readers, and feel assured that, on mature examination, they will admire as much as we do the symmetry and unity of the plan, and the accurate and, at the same time, poetical elaboration of the details.

INSTRUMENTAL.

Grand Duet for the Piano Forte. By Miss Mounsey. J. J. Ewer & Co., Bow Church-yard.

WE have before had the gratification of speaking in terms of high praise of the compositions of this lady. To her we owe a double debt of gratitude; first, for the delight she affords us by her combinations of sweet sounds, and then for the pleasure we feel in being, through her means, freed from the irksome task of always finding fault. The rarity of true excellence gives additional charm to its discovery, whilst the frequent recurrence of what is worthy of condemnation by no means diminishes the pain with which we witness it. The duet before us consists of four movements, and in its form resembles rather the instrumental symphony than the piano forte concerto. Throughout is evinced a power and excellence of modulation which, in a piano-forte composition of the present day, astonishes while it delights us. The passages of fugue and imitation shew that the fair composer has by no means neglected the higher walks of the art, and (if we are not much mistaken) that she is every way worthy of treading in them. The minuet is graceful and characteristic; but the slow movement which succeeds it, for the elaborate and skilful treatment of the subject, the variety and boldness of the modulations, and for the vein of true poetry which pervades the whole, deserves an admiration which we fear we cannot adequately express. In taking leave of Miss Mounsey for the present, we beg leave to assure her that we shall feel pleasure in again and again welcoming to our critical tribunal the efforts of her genius, confident that what she is to write will be worthy of what she has already written.

The Goblin Quadrilles. Composed for the Piano-forte by Calder Cambell (Madras army). London : T. E. Purday, 50, St. Paul's Church-yard.

MR. CAMBELL has certainly not been inspired by the "goblins," "spirits of fire," "water spirits," and "elfins," whom he has invoked both singly and conjointly. Of a truth they have treated him very scurvily. He has done all that he could to assist them in their revels ; and lo and behold how they have rewarded him ! One might have expected, at any rate, something of the elfin character about these quadrilles, something to make the hair stand erect, something hissing and boiling over, in consideration of the meeting of the fire and water spirits. All this it was rational to look for, and we accordingly did look for it. How were we astonished, then, on looking over the first page, to find it flat as ditch-water, or, to use a more savory simile, as champagne that *ought* to be up. When we had a little recovered from our first amazement : "O, O !" said we to ourselves, "this must be one of your surprise concerns ; there's something terrible over leaf, depend on it." In this belief, it was some time before we mustered courage to proceed ; and when we did so, it was something in the manner of the frogs of old approaching King Log after his first splash—slowly and cautiously. Like them, however, we soon found there was nothing to fear, and that Mr. Calder Cambell was totally innocent of any but the most lamb-like, simple, and every-day ideas. Really, it is not the nerves of every one that could stand such trials often ; and we do hope that when Mr. C. "again doth write" he will either brush up his enthusiasm, if he have any, to the proper pitch, or else light upon a *rather* less formidable title for his lucubrations.

Book of Musical Varieties. By Richard Sutton.

IF each of the names on Mr. Sutton's subscription list was available for pecuniary as well as for ostentatious purposes, he has, we think, no reason to complain of the success of his speculation. He is, we dare say, in condition to snap his finger at our criticism ; but we wish to say a few words to his subscribers and to those who may be so unlucky as to be canvassed in future. What Mr. Sutton is pleased to call "good feeling" is utterly inadmissible in such cases. Consider yourselves, for the time being, as the guardians of the interests of the art : let no personal motives of friendship induce you to patronize a work which you know to be unworthy of patronage. Or, if "good feeling" is to be admitted, shew yourselves *really* friendly, and sincerely advise the "composer" to avoid committing himself before the public, and robbing his friends' pockets. What, indeed, can be more impudent, more insulting, in the would-be composer, than thanks to his friends for supporting his work, without reference to the merits of that work ? to speak plainly, for raising a subscription to enrich the modest Mr. Sutton, or whoever he may

happen to be, for the race is numerous enough. As to the *Varieties*, our opinion of them it is unnecessary to deliver, for Mr. Sutton, in his preface, has given them condemnation sufficient, and has stated pretty plainly that, though but poor things intrinsically, they have served their purpose to *him*. We heartily congratulate him, and hope his subscribers are equally satisfied. We fancy they will have had enough of "good feeling" for some time to come.

The Sacred Musical Amulet; a Selection of Melodies from the works of J. S. Bach, Beethoven, Cherubini, Gluck, &c., to which are added several new compositions. By C. McHorkell. London: R. Cocks & Co., 20, Princes-street, Hanover-square. 1837.

IN a work which one sees, at the first glance, is intended for the Sabbath evening recreation of the "serious young lady," we expected certainly to find in abundance adaptations (as they are ironically called) of opera airs, fragments of the slow movements of symphonies, and disjointed excerpts from the masses of foreign composers, to verses (poetry we dare not call it) of sickly religious sentiment, or displays of unredeemed bad taste. All this we expected, and we have found it. But there is one piece of music the discovery of which in such a collection has delighted us in proportion to its unexpectedness; we mean the song by Sebastian Bach, by the greatest chance in the world (as we cannot but think) standing entire and unmangled, in all its native loveliness. Such a piece atones for many a fault in the rest of the work. Mr. Gauntlett's song is pretty, and with a few alterations might almost be faultless. We will mention one: if the melody in the fifth bar from the end were B \flat and C leading up to D, instead of G, the passage would be graceful and original, instead of being, as it now is, bald and abrupt. The "vision of dry bones" might have been dispensed with, words and all; if any one can sing it through, preserving his gravity, it is a wonder. We have nothing to say against the outer integuments and getting-up of the work, and only wish that the internal structure were equally excellent.

Preludes and Fugue in A Major, for the Organ, with a part for the Pedal Obligato. By Egerton Webbe. London: J. A. Novello, 69, Dean-street, Soho.

MR. WEBBE comes out in his first work a learned and experienced musician. He has not inflicted on the public the first crude essays of his genius, but has studied and practised in private, striving to merit a fame lasting beyond the present hour. If he do not obtain it he alone will be to blame; for his present work, if it do not deserve to live, shows at least that by patient and persevering cultivation of his genius he may undoubtedly succeed in producing others which may. What is most wanted in this composition, par-

ticularly in the fugue, is the art of concealing art, a certain appearance of facility, which, combined with depth of thought, is itself the highest result and aim of study. We hope Mr. Webbe will zealously pursue the course he has so successfully entered upon, and never rest satisfied, whatever excellence he may attain.

MISCELLANEOUS COMMUNICATIONS.

THE FACULTY OF LOCALITY IN PIGEONS.—A Liege journal gives a remarkable instance of the activity of the organ of Locality in the Pigeon. A Pigeon-fancier of Verviers went to Turin in 1832, taking with him a number of these birds, which he let loose. A short time ago one of these winged messengers returned safely to Verviers after five years absence. Whether the return of this single bird to its old habitation was mere chance or not, is a matter of doubt; but be this as it may, the *faculty* which enables the possessor to remember places is unquestionably strong in the Pigeon, and especially in the Carrier Pigeon.—Ed.

DESTRUCTION OF INSECTS.—At the last meeting of the Horticultural Society, a communication was read from Mr. Ingram, of Southampton, on a simple and efficacious method of destroying the Red Spider, Green Fly Thrip, Scale, and other insects obnoxious to vegetation, without any injury to the plant. It consisted merely in placing the plants within a frame firmly closed, and putting between the pots Laurel leaves well bruised. After remaining in this state for about an hour it will be found that all the two former insects are destroyed, and the plants must then be removed to a warm place; but an exposure to the vapour of the leaves for about eight hours is found necessary for the removal of the Thrip and Scale. For a house 20 feet by 12, two bushels of leaves are sufficient, which may be bruised inside; the roof and sides are to be kept close with matting, and the night time is considered best for the purpose. The effects are to be attributed to the hydrocyanic [or prussic.—Ed.] acid evolved from the leaves, which agrees with a recommendation made by Mr. Waterhouse, at a late meeting of the Entomological Society, for the destruction of insects in the canvass of pictures or wood of the frames (see *The Naturalist*, vol. ii., p. 92), and in old books, &c., similar to the plan he employs in destroying insects in specimens of Natural History. It consists in introducing a few drops of prussic acid into a box closed as tight as possible, and placing therein the infested article, when the destruction of insects will be very quick, as will be seen by their falling to the bottom of the box, which has sometimes been quite covered with them, although a small quantity only of the acid has been employed.—*Communicated by CHARLES LIVERPOOL, M.D., Plymouth, August 6, 1837.*

ARGONAUTS.—The long-disputed question of whether the animal found in the shell of the *Argonauta* be parasitical or not, seems as far from being settled as ever, notwithstanding the observations of Madame Power, and the experiments of Captain Rang, of the Port of Algiers; the arguments on one

side being most ingeniously adopted by the contrary side in favour of their reasons. All that appears certain is, that it swims backwards, like other animals of the same kind, and makes use of its two long palmed arms, with which it envelopes the shell, as if holding it on. A report made to the *Académie des Sciences* of Paris, on the proceedings of Captain Rang, concludes with a request to that gentleman to make the following observations, which we extract for the sake of others who may be inclined to put them in practice:—1st. To make the animal quit the shell, in the manner of Mr. Cranch's experiment, both in and out of the water, and especially in shallow places on the sea shore; 2nd. To ascertain the sexes of the individuals provided with shells, and whether they contain eggs; 3rd. Carefully to examine the position of all the individuals in the shells, whether they are taken from the bottom of the sea or from the surface, and see whether the position be alike in both instances; 4th. To repeat Madame Power's experiment, and ascertain whether the separation made of the broken shell by the animal takes place on the edge of the shell as well as elsewhere, and to note the duration of the experiment; 5th. To examine the nature of the piece of shell thus reproduced, with a magnifying glass and with chemical tests, and compare it with the rest of the shell, examined in the same manner; 6th. To repeat the second experiment of Madame Power, if it be possible, and find out if (against all analogy) the shell be not existing in the egg, whether it appears on the animal a few days after birth, and to note all the circumstances of its appearance and development.

CHURCH MUSIC.—It may safely be asserted that no nation can boast of so many sterling composers for the organ as the English; and in order to support this assertion it will only be necessary to mention the names of Purcell, Orlando Gibbons, Croft, Child, Boyce, &c. But, at the same time, in no other civilized country is church music so shamefully neglected. It is true that almost every parish church throughout the kingdom has a good organ; but where is the advantage of this, when the choice of an organist and the training of singers are almost, it may be said, left to chance? The organists of many of our *cathedrals* are excellent musicians and performers, but the singing is never what it ought to be, and the selection of music is anything but satisfactory. Music is almost universally considered indispensable in the service of the Church of England: why then limit it to the performance of a few psalms, badly played and worse sung? The only mode of removing this stigma from our church, would be to increase the salary of the organist very considerably, and at the same time to require him to organize the choir on week days, so as to be able to sing anthems, &c., in such a manner that competent musicians might be able to attend divine service without offence to their ears. That this would be a means of improving the taste of the English, both musical and general, cannot, we think, admit of dispute.—**ED.**

PHRENOLOGY.—At Vienna, in 1796, Dr. Gall for the first time delivered lectures on his system. Thus, although nearly 6,000 years have elapsed since the creation of man, the most important discovery ever made has been known only within the last forty years. Gall will ever be regarded as the greatest benefactor of his species. What Galileo has achieved for Astronomy, Harvey for Anatomy, Hahnemann for Medicine, that has Gall achieved for a subject which eclipses them all—for the Mind: and to use the words

of Mr. Combe, "in our applause he hears not the voice of a vain adulation, but a feeble overture to the grand strain of admiration which a grateful posterity will one day sound to his name."—*From a Lecture on Phrenology, delivered at the Campsall Society for the Acquisition of Knowledge, by Mr. C. T. Wood, jun.*

The advance which Phrenology has made within a few years, though gradual, is most striking; and the voice of him who speaks against the science is listened to with surprise rather than, as before, that of its advocate. The newspapers and other public journals, moreover, no longer raise their feeble clamor to aid in its demolition. Probably, however, it is, even now, more to the pecuniary advantage of a magazine, whether quarterly or monthly, to ridicule than to support Phrenology: but the majority of these pursue the wiser course of remaining altogether silent on the subject.—ED.

THE NAME "GARDEN THRUSH," AS APPLIED TO *Turdus Musicus*, *Auct.*—In *The Analyst*, No. xviii., I find the name "Garden Thrush" proposed to be substituted for Song Thrush. I should have given the name Garden Thrush to the Missel Thrush: at least its habits here would warrant such an appellation. I knew of five nests in gardens last year, and have already found one in a similar situation this year, snowy as it is.—THOMAS ALLIS, York, 3rd Mo. 24, 1837, in *The Naturalist* (No. xi., for August), edited by Neville Wood, Esq.—[The Missel Thrush occasionally frequents gardens; with the view of feeding on currants, gooseberries, &c.; but it generally breeds in small plantations near houses, and is, on the whole, not much seen in gardens; while, on the contrary, the species which we have named the Garden Thrush seldom occurs out of them.—ED.]

THEORY OF MUSIC.—It seems very odd that school-masters and music-masters should have hit upon the most laborious and irksome method they could possibly have devised for imparting to their pupils a knowledge of the "grammar" of language and music; namely, by separating the theory from the practice. That a pupil might write grammatically, both as regards language and music, without having been told any one of the rules composing grammar, is very certain, though at present seldom acknowledged. Some eminent musicians and music-masters are for discarding theory altogether; whether studied abstractedly or otherwise. The plan, no doubt, is feasible; but if theory is to be retained, let it go hand in hand with practice, the two being included in the same lesson, and much tedious and useless drudgery will be spared, both on the part of master and scholar.—ED.

TETRACNEMUS DIVERSICORNIS, *Westwood*.—This insect is figured in Charlesworth's (alias Loudon's) *Magazine of Natural History*, vol. i., n. 2., p. 268, with four branches to the antennæ. When I first saw it, I thought it was the same as my *Ceraphron samicornis*, being very similar as far as antennæ go. But mine is more like Mr. Curtis's figure of *C. Halidayi*, except that it has only three branches to the antennæ, and is scarcely more than half its size. I took my specimen on a Birch at Knighton Heath, near Dorchester, August 11, 1832; also Mr. Westwood's *T. diversicornis* on an Oak in Coombe Wood, July 3, 1835.—J. C. DALE, *Glanville's Wootton, Dorsetshire, May 30, 1837.*

MUSICAL CATECHISMS.—Hamilton has published various musical catechisms; amongst others one on the organ. We have a great horror of compilations of this nature; and the fact that a work of more value on the organ

would be suffered to rot on the bookseller's shelf only proves the benighted state of the English with regard to this noble instrument. We had proposed skimming the pages of this little 18mo., but when we reached the passage where the author observes that "*next to the swell in importance was the introduction of pedals*," we shut the book, observing to ourselves that no real love of the organ could have actuated the compiler to pen his little catch-penny.

—ED.

EFFECTS OF PRUSSIC ACID ON A RABBIT.—At the conclusion of a lecture delivered at Maidstone, by Dr. Robinson, on poisons, the effect of prussic acid was tried upon a Rabbit. Three drops were administered from a glass—the surface of which most probably abstracted half the quantity—and the animal immediately exhibited the usual symptoms of rapidly approaching dissolution. In order to give it a chance of recovery, however, a few drops of ammonia were administered, without apparent benefit. A constant stream of cold water was then poured upon the base of the skull and along the spine, when the animal very shortly exhibited signs of resuscitation. It was then wrapped in warm flannel. In a quarter of an hour it was sufficiently recovered to walk. Dr. Robinson mentioned that this mode of treatment had been discovered by accident. A Cat, which had been annoying to the apprentices of a chemist, was poisoned by them with prussic acid. By mere chance, however, it fell under a stream of cold water which was pouring from a pump, the effect of which was its gradual resuscitation. Benefiting by this hint, the same means have been applied to more than one human subject who had taken prussic acid. No instance, however, had before come within Dr. Robinson's knowledge where an animal had been restored after the symptoms this Rabbit exhibited. The Rabbit is now in full health and vigour.

ORGANIZED BEINGS.—The reports of the Academy of Sciences in France have been filled by the voluminous papers of M. Isidore Geoffroy St. Hilaire, M. Moquin Tandon, and M. de Serres. The first treats of the possibility of extending our knowledge of the natural history of man by the study of domestic animals, which, according to the author, will, from its strong affinity [*analogy* ?—Ed. An.] with the subject, elucidate many important effects. The second concerns the formation of vegetables, proceeding either from a centripetal or a centrifugal force. The third has for its subject the development of the genus *Rotellina*. One and all are based upon the system of M. Geoffroy St. Hilaire; that is, the unity of the creation, or the existence of but one great type.—*Athenæum*.

THE BASILISK.—This reptile is of a very harmless nature, though by some means or other inheriting a most formidable name. The application of the fabled names of antiquity, such as the Cockatrice, the Dragon, and the Basilisk, to the realities of modern Natural History, is not only absurd, but must, in some instances, be attended with bad consequences. Men read with horror, in their boyish days, of the terrible powers of Dragons and the deadly venom of Cockatrices and Basilisks; venom so deadly that it not only killed all else upon which the terrible creatures looked, but if they happened to meet the reflection of their own withering glances from a mirror or a pool of water, they could not escape the death-stroke of their own looks. These terrific qualities make a deep impression upon the youthful mind; and as the name is the index to all the terrors, the repetition of it necessarily suggests

them. Thus there must be a most curious conflict between memory and present perception when the Dragon is found to be a creature that can hurt nothing stronger than a Fly, or that the Basilisk is a harmless and pretty little creature—for, although peculiar in shape, it is pretty—that lives upon small vegetable seeds, and neither hurts nor is capable of hurting a single living creature. The reality which addresses itself immediately to the senses must, in the end, get the victory, how hard soever the impression on the memory may plead. Thus the fable is discarded, and takes along with it all which it in any way holds linked by association. The school and scholarship, and all that is connected either with the one or the other, come in for their share of the doubt, disbelief, and derision; and that which, but for the discovery, would have continued to afford excitement, and therefore pleasure, becomes the foundation of self-humiliation and reproach. Either, therefore, the fable should be given up, or the name which turns it into a mockery should cease to be used. The fable has its use in attracting the mind at an age at which it could not be attracted by reality. Boyhood, when the hopes are full of the joys of years unborn, is a time of romance, and all the utilitarians that ever lectured will never make it otherwise. And it is well for us that they cannot; for the reality of life is the painful portion of it, and the romance the pleasurable. Not only so, but that which the utilitarians call the reality is the sensual, the animal, the material part of life; and the romance is the mental or intellectual part. If the former is made the sole object of consideration, then the result is misery in this life and no hope hereafter. There is consequently an immediate and utter extinction of all that is pleasant in life, of all that is endearing in society; because there remains no value but money value, and "*Thy money perish with thee*" is the denunciation which takes effect both here and hereafter.

We are not pleading for fables, or attempting to recommend that which is not true at the expense of the truth. But in "the youth of life" it is vain to refer to that which in after life is called "utility," as the only or the chief incentive to study. You cannot, at every step of a boy's education, draw his attention to his book, or his other study, by the allurements of the "price that it will bring him in;" and if you could, what a mean and sordid creature, nay, what an immoral and dishonest creature, you would make of him! If we labour to impress upon the young mind the idea that there is no value but in possessions, and no reward but in pecuniary payment, we absolutely, in express terms, teach fraud and theft, destroy all the better feelings of the mind, and make man no better than a beast. We take the very worst view of the worst conduct of human beings as the foundation of character; and then we need not wonder that our pupil ripens into crime: and as the law is not abolished, the feeling which we thus inculcate, that law and justice are evils, because restraints upon *utility*, renders him obnoxious to punishment. Little romantic extravagancies appear to be as necessary for young minds as they are for young nations, among which they have ever been found; and though they are only "play" in after-life, both with the one and the other, yet the period when they cease altogether is the dotage of senility—the sad condition from which earthly hope has for ever departed. It is, therefore, always to be regretted when the reality spoils a fable which gives pleasure: and the instructor who preaches truth in this wise is exactly the counterpart of him who should go about to make a man zealous and enterprising in his

business by disclosing to him at the outset all the failures, impositions, frauds, and misfortunes, to which he should be subjected in the course of it. Applying the fabulous names of the ancients to the real productions of Nature is but one form of this mode of making knowledge the destroyer of happiness, but it is one which brings no good to compensate the evil. It destroys the marvel of the boy, but enough of that marvel remains to turn into ridicule and contempt the knowledge of the man. The withering power which the eyes of the fabled Basilisk were endowed with gives point to some of the choicest passages in poetry; and to persons of fine feelings these passages give more abundant and exquisite pleasure than they could purchase in "the market," even if they had the wealth of the Indies to lay out in the purchase of it. Now if, along with these passages, there comes always the conviction that the said Basilisk is equally frail and harmless as a Butterfly among the flowers, there remains no more pleasure—derision, contempt, is the natural feeling. It is of no use to plead that it is a different Basilisk altogether, for there is identity in the name; and if the fabled name has been bestowed upon a reality which has not the attributes of the fable, then the bestower of that name has been guilty of a falsehood. Any one who wishes to judge how much of poetic enjoyment may and must be destroyed by this misappropriation of names that had their meaning before, may turn to the second scene of Richard the Third, and read on to this line, spoken by Lady Anne :—

"Would they were Basilisks, to strike thee dead!"

Substitute the word "Butterflies" for "Basilisks;" read the line thus :—

"Would they were Butterflies, to strike thee dead!"

and feel the power of the scene if you can. Yet the Butterfly of Natural History is quite as likely to strike one dead as the Natural History Basilisk; and thus, while the application of the fabled name destroys the force of the fable, the memory of the fable turns the real animal into ridicule. The application of sounding names where there is no analogy to warrant their use, has done much mischief in all the departments of Natural History, and also in all the other subjects from which these names are taken.

The Basilisk of antiquity (and it was gravely described by Pliny and Galen among the ancients, and has been so by Lobo, Prosper Alpini, and Aldrovandi, among the moderns) was a terrible creature. Among the pools and lakes of that land of marvels which gave source to the mighty flood of the Nile, it reigned in terrible majesty; but it reigned in desolation. Its name was derived from the Greek word *βασιλίσκος*, "to reign." It had eight feet, two large scales for wings, was of a golden yellow, and its head

"The likeness of a kingly crown had on."

The taint which it communicated to the air was more deadly than that fabled of the Upas-tree, and believed by naturalists; for no animal could breathe the same air and live, and its glance was instant death, even to the Lion himself. Nature could not, of course, form such a creature in the ordinary

way, but, like the Cockatrice—the dread of which has perhaps not altogether ceased in this country—it was hatched by a serpent out of the egg of a Cock! Though adopted by very sage and learned naturalists in the plenitude of their credulity, and continued by their copyists, the Basilisk of the ancients was purely a poetical creation, the emblem of regal tyranny, in short; and its origin was made unnatural, and the scene of its dominion laid in the desert, because to have spoken more plainly at home might not have been altogether safe. It does not follow, however, that the ancient poet who imagined the fable believed in the material existence of the Basilisk any more than Milton did in that of his personifications of Sin and Death, or Shakspeare in those ghosts which he conjured up with such matchless skill, and upon which the poetic beauty and the moral grandeur of some of his best passages are made so much to depend. We have deemed it advisable to notice, in this striking instance of it, the prostitution of poetic or allegorical names to the subjects in *Natural History*.—PARTINGTON'S *Natural History*.

THE BADGER.—This is a very quiet and inoffensive animal, more so, perhaps, than any other quadruped of the same size, for it hurts neither animal nor plant, at least in those species in which man takes an interest, or upon which he sets a value. Its food is understood to be fruits, roots, and grass, and also insects and other small animals, though not any thing larger than a lizard or a frog. It is not capable of climbing, and thus it can injure nothing which grows or perches upon trees, bushes, or tall stems; and as it usually keeps its burrow during the day, the live part of its food must consist only of those creatures which come out to feed during the night, many of the mollusca, and other small animals having that habit. It is thus very probable that Badgers are of service as scavengers in those places which lie near their burrows, by destroying animals which, but for them, would, in the natural state of those rude places, become noxious from their numbers, and destructive from their havoc upon vegetation. In some parts of the country, the Badgers have been most unfairly accused of invading the mansions of the dead for the purpose of gratifying their appetite. Their facility in burrowing and their offensive odour may both contribute to strengthen such a prejudice on the part of the ignorant. But it is nevertheless totally without foundation. Badgers burrow not for the purpose of eating, but that they may have warm and safe berths, which they render comfortable by bedding them with soft grass; and they would not eat the contents of graves, even if offered to them without any trouble on their part. The writer of this article remembers, when a boy, being present at the extirpation of a small colony of Badgers, which stood accused, by current report, of this species of profanation. The surface of an upland, but rather rich district, was finely diversified by swelling knolls along the north bank of a winding rivulet; and as the rivulet had, according to the custom of rivulets, "taken from the height and given to the hollow," there were steep and tangled banks at different places, open to the south-west, which was the descent side of the country; was snug and warm, and as well adapted for both birds and Badgers, as thickets of fragrant Broom upon sloping banks could be. The name of the Badgers operated in some sort as a protection to the birds, as the boys seemed afraid to venture far into the brake in their nesting excursions, lest they should slip a leg into a Badger's hole, and be drawn out minus a toe or even a foot. So Linnets, and Blackcaps, and Whitethroats reared their broods, and sung "round" in high

glee, protected by the mighty name of the Badger.—One of these tangled banks was immediately below an ancient place of sepulture, where, previously to the Reformation, there had been a little chapel. This place was still the burial-ground for the barony; and it was a place not altogether free from the suspicion of things unearthly. There was a large equisetum-tufted pool, between the knoll of which the cemetery occupied the summit and the higher grounds above; and *ignes fatui* sometimes sported on its margins, under the suspicious name of “elfin candles.” Besides, immediately under the south-west angle of the little enclosure, there flowed a fountain of pure and sparkling water, so abundant that it would have sufficed permanently to turn a mill. This fountain abated not a jot of its quantity and altered not a degree of its temperature, summer or winter, wet or dry; and while all around was coated with snow to the depth of two or three feet, this fountain not only remained “clear in the eye,” but the stream from it flowed smoking along an open channel, proof alike against the powdering snow and the curdling frost. The springs of these things, fountain and all, lay deeper than the rustic philosophy, and thus, as the general custom is, they were sent to the limbo of superstition, and all who dwelt immediately thereabout along with them. The sod upon some graves, one summer, sunk deeper than had ever been known to proceed from the mere insatiate yawning of that “daughter of the Horse-leech” for the relatives of the occupant; and the suspicion of foul play—to the brim of horror’s deep chalice—fell upon the Badgers. The “landwehr” were summoned; and they came girt with fierceness or with fear, and armed with spades, mattocks, and pitchforks, to take by sap and mine the stronghold of the grey-pates, and let the light of heaven shine upon the den of their secret abominations. One party plied the work with mattock and spade, while another stood with their arms prepared in case the besieged should make a hostile sortie, or attempt escape; and to guard against the latter some dozen of curs had been brought as auxiliaries.—At length they came to a little chamber, in which there was a small quantity of withered grass, but not a single vestige of bone or other animal remains. Again they worked away; and soon the male Badger made his appearance and his escape, the opening ranks on either side greatly contributing to speed the latter, and one man declared, with “*ecce signum*” display, that the monster had “dinted his steel spade with only a passing snap.” Two or three grievous whines from the curs gave proof that the Badger could “dint” something else, and soon a most triumphant flourish of yelping announced that he was fairly in the next cover and the danger over.—It was now resolved to change the mode of attack, and proceed by fire and smoke. When these were continued till all within must be either roasted or suffocated, they began to dig anew, and after passing another chamber which contained only grass as before, they came to a third, containing the bodies of a suffocated female and three cubs, the latter very small in size, and two of them clinging to the teats of their mother. These bodies were not treated with that decorum which became a generous foe in the hour of victory. It was found that the excavation reached no farther than the entrance and the three chambers, so that the Badgers could have had no subterraneous communication with the graves, which rendered the sunken appearance more a matter of alarm than ever. Throughout the whole burrow, there was not the smallest vestige of any animal remains—nothing but “beddings” of grass, rather

more abundant in the chamber where the family was than in any of the others. The result of the search did not, however, remove all stigma from the character of the Badgers. The story is mentioned as one instance of the means by which the characters of animals come to be misrepresented. They have one or two traits of appearance or habit which do not suit the popular taste, and by means of loose analogies, often drawn from subjects of a totally different character, others are added, till the truth is completely buried under a mass of exaggeration.—*Partington's Natural History.*

AUSTRIAN MUSIC AND DANCING.—The darling passion of the Austrian Mountainers, is for music and the dance. They appear born with a taste for music. A violin or guitar is a part of the furniture of every cottage, and not unfrequently a piano—each valley has its own peculiar airs, full of sweetness and melody. They are similar to those which the Tyrolese Minstrels made so popular in England a few years ago, and which are nothing more than the ordinary songs of the shepherds and dairy-maids on the mountains. They carol forth these lays with a peculiar intonation of the voice within the throat, making the echoes ring with their wild notes. The talent of improvising is not uncommon among the peasants of Tyrol and Styria; but it may be supposed their verses have little claim to polish or harmony. They generally assume the form of a dialogue; the verses of one being taken up and answered by another: they are mostly satirical, and the chief merits of the composer seem to consist in a quickness of repartee; one party striving by jests to render the other ridiculous. Sometimes the verses assume the more tender shape of a lover's address to his mistress, and his eloquence and skill are exerted in attempting to soften her heart—her wit being directed to repel his ardour and to laugh at his passion. In some parts of Tyrol, the peasants compose entire plays, of which they themselves are the actors. The subjects are usually taken from the well-known legend of a saint, or from some incident in Holy Writ; and, in this respect, they are not unlike the ancient "Miracles and Mysteries"—the first theatrical performances known in England. Their pretensions to plot and elegant versification are very humble. The performers, in some instances, are girls, who represent both the male and female characters. It is in the villages around Inspruck that these plays are most in fashion. The visitor will be amused there by such a homely effort of the tragic muse.

No fete-day, holiday, or marriage passes off without a rustic ball. Such entertainments afford the traveller insight into the manners and customs of the people, and an opportunity of observing the varieties of costume and amusement: those, however, who have formed their notion of a Tyrolese dance from a ballet at the Opera, will be much disappointed. They will find the dancers assembled in the close low room of an inn, so thronged that it would appear impossible to move, much less to dance, among the crowd: yet no sooner does the music strike up than the whole is in a whirl. No jostling or confusion occurs, and the time of the waltz is kept with most unerring precision. Instead of the elegant costume of the theatre—short petticoats and flying ribands—they will find the lasses decked out in pointed hats or round fur or woollen caps, or in handkerchiefs tied under their chin, and with waists reaching up near to their necks. The men often wear Hessian boots, which they strike together with great clatter by way of beating time, every now and then uttering a shrill cry and leaping round in the air exactly

in the manner of the Highland Fling. The enthusiasm, almost approaching to frenzy, with which the dance is kept up, in spite of the heat and crowd, from noon till night, is truly surprising. The partners often seize each other by the shoulders, in an attitude not unlike hugging. They do not always follow the same monotonous revolution; but at one time the man steps round his partner; at another, lifting her arm high in the air, he twirls her round on her heel with a rapidity that makes her appear to spin, and then quickly re-uniting they resume their circular evolutions with an agility and perseverance truly marvellous.—*Guide to Southern Germany.*

ALPINE PASTURAGE.—From the elevation of a great part of its surface above the level at which corn grows, the Tyrol is necessarily a pastoral country. The wealth of its inhabitants lies in cattle, which furnish milk and cheese, their principal food. Scanty crops of Buckwheat, Rye, and Oats are cultivated as high as the climate will allow in the secondary valleys; but in consequence of the vicissitudes of temperature, the crop, when cut, is not allowed to remain on the ground: it is either conveyed at once under roof, or, if made into sheaves, it is stuck upon light wooden staves with branching arms, the uppermost sheaf being spread as a roof over those below it. A line of these stakes looks, at a distance, like an army of giants. The natural meadows which clothe the mountain sides furnish, even up to the verge of perpetual snows, a short thin herbage of the most nutritious kind, very palatable to the cattle. In the early spring, when the Cows are first driven out of the stalls in which they have passed the winter, they are confined to the lower part of the valley: but as fast as the lower meadows are exhausted and the snow disappears from the higher pastures under the influence of the summer sun, the cattle are driven upwards. The meadows producing the thickest grass are set apart for a hay crop; and, when cut, this is hung to dry on racks consisting of horizontal poles, supported between two upright posts, and covered with a narrow roof to turn aside the rain. It is then stored in isolated barns or challets, and is dealt out as wanted with the strictest economy. In order to save it as much as possible, the cattle are sometimes fed on stalks of maize sprinkled with salt, or upon the leaves of the ash, which are stripped from the tree for this purpose. The real life of the cowherd of the Alps differs widely from the beau-ideal of poetry and romance. For six or eight months he is banished from the haunts of men, above the clouds, occupying a wretched challet, perhaps half-buried in the ground to prevent its being carried away by avalanches. He must be constantly on the alert to prevent his charge from straggling or falling over precipices, and he must be prepared to protect them from the bear and the wolf. After such arduous labours and anxious care, it can easily be understood that the day on which the cattle return home from the Alps is a day of rejoicing both to the master and cowherd, provided the supply of butter and cheese be large, the herd healthy, and no casualties have diminished its numbers. Their return usually takes place about Michaelmas, or St. Matthew's day.—Wreaths of flowers, ribands, and bells are sent up the mountains before hand to decorate the animals, which make their entry marshalled in regular procession. At their head marches the pride of the herd (the most distinguished for size and beauty), who has invariably proved his right to precedence by combats with the rest, which the herdsman rather promotes than checks, knowing that they will conduce to future tranquillity as soon as the matter is once settled. The

victor is entitled to wear the largest wreath and bear the most sonorous bell attached to his neck by an ornamented belt. He shows by his steady gait that he is fully aware of the dignity. From time to time he gazes round to observe that none break the rank; and should some heedless bull-calf venture to press forward out of his place, he is speedily reminded of his proper position by a poke in the side from the horns of the indignant leader. The rest of the herd are provided, according to their pretensions, with trappings and bells; and the din and uproar which prevail in a town, caused by a clatter of metal intermingled with the shouts of herdsmen and the lowing cattle, when the herds of different proprietors enter at the same time, produce a scene not unlike one of those unmusical concerts which the French call a *Charivari*. Such tinklings are anything but drowsy. Behind the cattle walks the herdsman, or *senner*, decked out in his best, with a bunch of gay flowers and a sprig of rosemary in his hat. He drags after him a thick thong of leather, fifteen or twenty feet long, which ever and anon, by a strong exertion of muscular force, he wields above his head and cracks like a whip, but with a report as loud as a pistol, much to the edification of the spectators and to the terror of all stragglers and loiterers in the herd. The farmer, or proprietor, brings up the rear, riding in a neat small cart laden with rich butter and cheese.—*Idem*.

PASS OF THE STELVIO.—This very remarkable road, the highest in Europe practicable for carriages, being 2,300 feet, or nearly half a mile, perpendicular above the Simplon, and 1,000 feet above the Great St. Bernard, was constructed by the Austrian Government in order to open an additional line of communication from Inspruck to Milan, between Vienna and the centre of Lombardy. It was completed in 1824. Whether we consider the boldness of the design, the difficulties of its execution from the great height and exposure to storms and avalanches, or the grandure of the scenery through which it passes, the rout of the Stelvio is the most extraordinary in Europe. The galleries cut for miles through the solid rock, along the margin of the lake of Como; those higher up built of massive masonry strong enough to resist the fall of avalanches; the long causeways carried over morasses; the bridges thrown across torrents; the long succession of zig-zag terraces carried up with so gradual a slope that an English mail-coach might trot up on one side, and scarce require to lock a wheel on the other, which nevertheless scale and surmount one of the highest ridges in the Alps; these are works which, without exaggeration, deserve to be called stupendous. But the works and agencies of Nature with which they come in contrast reduce them to comparative insignificance. This road, upon which so much labour and treasure has been expended, is seldom passable for more than four months in the year, from June to October. Every spring, when the snow disappears, the ravages of the winter's storm and avalanche are disclosed to view; wooden galleries broken through, large tracts of the road swept away, others overwhelmed with rubbish and fragments of rock. These injuries, annually occurring, are to be repaired only at the vast expense of 11,000 florins a-year, and after a lapse of considerable time. From June to the beginning of October, the passage is generally secure from all risk, except immediately after a fall of snow. Under such circumstances it is prudent to wait twenty-four hours. The most interesting scenes on the rout are the shores of the Como lake and its excavated galleries, the gorge of Spondalunga, the splendid view

of the range of the Orteler Spits with its snowy glaciers seen from the highest point of the pass, and the glaciers on the Tyrolese side which the traveller, rolling along in his carriage, first looks down upon, and approaches near enough to throw a stone upon them—a prospect which no other Alpine carriage-road presents in any other part of the world.—*Idem*.

ALPINE FORESTS.—The magnitude and number of the Tyrolese and Styrian forests forms one of the distinguishing features of those countries, when compared with Switzerland. They cover the middle regions of the Alps, and encroach more than the latter upon the verge of the cultivated fields, which occupy the lower part of the valleys. The character of the forests of the Austrian Alps has been drawn by the masterly pen of the author of *Vathek*. "There seemed no end to these forests, except where little irregular spots of herbage, grazed by cattle, intervened. Whenever we gained an eminence it was only to discover more ranges of dark wood, variegated with meadows and glittering streams. White Clover and a profusion of sweet-scented flowers clothe their banks; above waves the Mountain Ash, glowing with scarlet berries; beyond rise hills, and rocks, and mountains, piled upon one another, and fringed with Fir to their topmost acclivities. Perhaps the Norwegian forests alone equal these in grandeur and extent. Those which cover the Swiss Highlands rarely convey such vast ideas. There the woods climb only half-way up their ascents, which then are circumscribed by snows; here no boundaries are set to their progress, and from their bases to their summits the mountains display rich unbroken masses of vegetation." At first it might appear that these vast store-houses of timber, from their extreme remoteness and the difficulty of access, would hardly be of any value to man, and that the trees would be allowed to ripen and rot, undisturbed by the axe, on the spot where Nature sowed them. This is by no means the case. There are many remote districts of the Austrian Alps where timber is the sole produce, where the people draw their subsistence entirely from the forests; and human ingenuity has contrived means by which the stately stem of the Tyrolese Larch, which has grown to maturity close to the glaciers of the Orteler Spitz, is transported to the arsenal of Venice or the port of Trieste, while that which has flourished near the fountain-head of the Salza, may be found, in the course of a few months from the time when it has quit- ted its native forests, serving as a mast to some vessel of war or merchandise on the Black Sea. There can be no difficulty in the transport of timber growing on the borders of a navigable river; but it is a different thing when it grows at the distance of many miles from any stream capable of floating a log, or where the streams flow in a direction opposite to that in which the wood is to be carried. The first of these obstacles is overcome by means of slides (called *riesen*), which are semicircular troughs formed of six or eight Fir-trees placed side by side, and smoothed by stripping off the bark, and extending sometimes a length of many miles. They are constructed so as to preserve a gradual descent, are not always straight, but made to curve round the shoulders of the mountains, being carried in tunnels through projecting rocks, or conducted over ravines and depressions on the tops of tall stems like the piers of a bridge, until they terminate on the borders of some stream capable of carrying them onwards. The great slide of Alpnach was constructed in the same manner; it was, however, a first attempt, and did not succeed. The Austrian forests are every where traversed by these contrivances,

which form, in fact, the inclined plane of a rude railroad for the timber. Let the traveller take heed in passing these slides after snow or rain has fallen. The wood-cutter waits for such favourable opportunities, when the ground is slippery, and the rivers are high, to launch forth the timber which has been cut many weeks before. The logs descend with the rapidity of an arrow, and it would be certain destruction to encounter one in its course; so great is the force they acquire in their descent, that if by chance a log strikes against any impediment in the sides of the slide, it is tossed out by the shock, and either snapped in two like wax, or shivered to splinters. The streams which traverse a forest-district are often so shallow, and so much impeded by rocks, that even after rain they would be insufficient to carry the wood. In such cases a strong dam is built across the stream, at a point where its channel is narrowest, usually at the mouth of a gorge; and the waters are pent up by sluice-gates until they have risen so as to form an artificial lake. In this sheet of water the logs are collected from the surrounding forests. At a given signal the sluice-gates are opened, and the pent up waters force their way down the valley, bearing along the wood with which they are freighted, until they reach a larger stream capable of floating it without artificial aid. A few only of the finest trunks are formed into rafts, and transported down the Danube into the Black Sea, or into the Adriatic, for ship-building. The greater part of the wood is consumed in the country where it grows for fuel, for supplying the salt-pans and mines, or it is converted into charcoal for the smelting and forging of iron. But it constantly happens that a ridge of high mountains intervenes between the forests and the salt-works and furnaces; and that the timber grows on the opposite side of the hills, where the stream flows in a contrary direction to the point where it is wanted. Under such circumstances the trees, instead of being thrown down from the height, must be carried up the ascent, which is, of course, much more difficult. The transport is then effected by means of a vast inclined plane, extending from the bottom of the valley to the summit of the nearest cliff or height overhanging it. A number of waggons are constructed to run up and down it, in a sort of rail-road. When loaded they are attached by ropes to a species of windlass communicating with a water-wheel, which is put in motion by turning on it the stream of a mountain torrent. By this means they are raised to the top of a precipice many hundred feet high, and are then transported down the opposite side in the usual manner. The business of the woodman affords occupation for a great number of persons. They set out early in spring in gangs, and repair to the spot where the wood is most abundant and of the finest growth; they build themselves rude huts of logs and branches, and begin lustily to ply the axe. The trees are then sorted into stems fit for masts or ship-building, which is merely lopped, and into wood fit for fuel, which is cut into logs, split, and dried; the whole is then heaped up in vast stacks. As soon as the winter has fairly set in, and the snow has fallen deep, so as to fill up the hollows in the mountains, the wood-cutter puts the cramp-irons upon his feet, and, either by the aid of oxen or upon a hand-sledge, conveys the wood to the borders of some neighbouring precipice, or to the side of one of the slides above mentioned. The snow is partially removed from the trough of the slides, and a few logs are thrown down to smooth it and make the passage clear. Water is also poured down it, which speedily freezes and covers it with a sheet of ice. This serves to diminish

greatly the friction and assists the rapidity of the wood's descent. The logs are then discharged, and descend with the quickness of lightning into the depth below, passing in a few minutes over a distance of several miles. The effect of such a discharge is much heightened when the slide terminates on the brow of a precipice overlooking a lake. The mountains around re-echo with a report like that of thunder: vast trees, hurled forth with the ease of a bundle of sticks, clear half the width of the lake in their leap; and, descending with a splash into its waters, ruffle the surface far and wide, and strew it, as it were, with the fragments of a wreck. The duties of a woodman do not end when he has thus discharged the wood; many logs and stems are arrested in their progress by some projecting mass of rock or tuft of bushes, and may be seen adhering to the sides of the ravine or precipice, looking, at a distance, like straws scattered over the hill-side. The woodman must disengage these, and see them fairly and prosperously on their way. At times, where the timber falls from a great height, the hardy woodman is let down by a cord, axe in hand, in the face of a precipice or cataract, to clear away all obstructions. In like manner he must push off and set afloat the timber which runs aground, or is stranded in the bed of the river. For the purpose of collecting the swimming wood, a species of barrier or grating of wood is erected across the rivers, at the entrance of the great valleys, or in the neighbourhood of the salt-pans and charcoal furnaces. It is here arrested and sorted, according to its quality, by the persons to whom it belongs. Different proprietors distinguish the wood belonging to each of them by cutting the logs of a particular length, so that, even when several owners discharge their timber into the river at the same time, it is easily sorted and appropriated. A tax of a certain sum upon every stack of wood, is paid for the use of the river and the services of the woodmen. In some of the remote forests trees of huge dimensions may be met with, giants of the vegetable creation. A Larch which stood near Matsch, in the Vintsehgau, was called "The King of the Larches," since seven men could scarcely surround its trunk with outstretched arms. A Fir (*Pinus picea*) growing on the Martinsberg, in the forest-district of Zerl, measured five feet in diameter at nine feet from the ground, and at a height of between ninety and ninety-five feet from the ground still retained a diameter of between eight and nine inches. The species of Fir called by naturalists *Pinus cembra*, which grows only on the limits of vegetation on the borders of glaciers and everlasting snow, is much prized in the Tyrol, as well as in Switzerland, for the facility with which it is cut in figures, bowls, spoons, and other utensils and toys. It is out of this wood that the inhabitants of the Grodnerthal carve the crucifixes which are so abundantly dispersed in the Tyrol, and the pretty toys of Berchtesgaden are made of the same material.—*Idem*.

THE CRYPTOGAMOUS PLANTS.—MR. W. A. Leighton, of Shrewsbury, has published a "Catalogue of the *Cellulares*, or Flowerless Plants of Great Britain, or those included in the Linnean Class, *Cryptogamia*; compiled from Sir W. J. Hooker's *English Flora*, Sir J. E. Smith's *English Flora*, Mackay's *Flora Hibernica*, Henslow's *Catalogue of British Plants*, and other sources." Mr. L. is of opinion that the increased and increasing study of the cryptogamic tribes affords a sufficient apology for the publication of a Catalogue which has for its sole object the facilitating an interchange of specimens, as well as to form a convenient index to those already in the herbarium; and,

if this is interleaved, as it always ought, to be a register of the localities where the rarer species are to be found. His arrangement, as modified from those of the best modern British botanists, is explained in a prefatory notice. He adds the authority for each species and variety; and for those varieties which have not hitherto received an acknowledged name, he has framed one as far as possible characteristic of their peculiarities, to which is appended the name of the author who considers the plant as a variety, with a distinguishing mark prefixed. This Catalogue of Mr. Leighton's displays evidences of being constructed with extraordinary attention to accuracy and usefulness; and although his entire list of cryptogamous vegetables does not extend beyond thirteen pages, it constitutes an admirable approximation to perfection in the accomplishment of its objects.

GEOLOGICAL EXCURSION.—Professor Phillips, accompanied by several members of the Philosophical Institution of Birmingham, with some other friends, lately made a geological excursion along the new line of canal to the Lime caverns at Dudley. The Basaltic columns at Rowley, the Wren's Nest, and the Lime caverns were the principal objects of attention in the day's excursion, and the Professor communicated the following observations on the Geology of this interesting district:—*Rowley Hills*. The party visited a characteristic point of this undulated range of Basaltic rocks above the Brades, where a considerable exposure of columnar rocks has been made for the purpose of obtaining materials for mending the roads. These columns are jointed across, and the interest of the locality is augmented by the influence of atmospheric decomposition on the surface of the stone. Professor Phillips took occasion to notice, with regard to the structure of Pyrogenous rocks in general, and Basaltic rocks in particular, "that the directions of the columns or prisms was almost invariably rectangular to the surfaces within which the rock was confined and by which its rate of cooling was influenced. If these surfaces are horizontal, the prisms are vertical; if vertical, the prisms lie horizontally." The jointed structure of the prisms he referred to that tendency observed by Mr. Gregory Watt in fused igneous masses to solidify round centres into globular concretions; and he pointed out the extreme resemblance which these jointed rocks offer (when, under the influence of atmospheric decomposition, the angular joints become flattened spheroids) to the celebrated *Kasekeller*, which he has examined near Bertrich, in the Eyfel—so called from the resemblance of these pillars, composed of flattened spheroids, to heaps of cheeses.—*Wren's Nest*. The rocks seen in this extraordinary range compose the upper part of the Silurian system of Mr. Murchison, and consist, in descending order, (as the canal penetrates them) of Shale, called Lower Ludlow rocks,—*Limestone of Dudley*, and *Wenlock Shale*. The Limestone of Dudley is in two divisions, separated by a good thickness of Shaly beds, which, as well as the Limestone, are fossiliferous. Both of the calcareous portions yield good Limestone, and as the inclination of the strata in the hill is very steep, the entrance of the canal has afforded extraordinary facilities for working these valuable rocks. The strata dip or decline each way from the central line or axis of the Wren's Nest hill, which is nearly north and south, and thus it happens that, in perforating this hill, the strata are found on one side dipping 70° to the east, and on the other 45° or more to the west. Remarkably long joints were observed in the subterranean works, which were measured by Professor Phillips, and explained to the

party as of great interest in questions recently brought under discussion as to the forces originally concerned in consolidating and subsequently in uplifting the strata. He proceeded to notice numerous spar veins; and he observed, "From the information of the very intelligent managers of the underground works, the effects of dislocations or disruptions of the rocks were ascertained to follow a certain geometrical law, which has been often insisted upon by myself, and admitted by Mr. Hopkins in his excellent paper on Physical Geology in the Cambridge Transactions. The Wren's Nest hill is one of several hills, all composed of Limestone and Shale, subjacent to the Coal formation, and directed from north to south. It appears probable, from the appearances at the south end of the Wren's Nest, that the *elevation* of this interesting ridge was accomplished before the rocks were consolidated, since the strata are found to bend round in a manner difficult to understand, unless the rocks were soft at the time of the movement. The Coal formation is *generally* conformed to the Silurian Limestones and Shales." The Coal is charred near the Rowley Basalt; and it was suggested by the Professor that these and other interesting phenomena might deserve the special investigation of the Philosophical Institution, and ample illustration by a collection of characteristic specimens.

EXTRACTS FROM FOREIGN JOURNALS.

METEOROLOGY.

ON THE TEMPESTS OF WESTERN INDIA. BY MR. W. BEDFIELD, OF NEW YORK.—The object of this paper is, to prove that the violent storms which so often visit the islands of the Atlantic do not present an erratic and indeterminate character, but, on the contrary, that they are remarkably regular. After researches founded on facts, the author announces that these blasts of wind generally follow the same direction, namely, to the north-west between the tropics, and at a latitude of 30° north. Near this parallel the tempest turns to the north, and subsequently its direction is north-east, in a region occupying the elevated latitudes of the Atlantic. The course thus pursued by the hurricane is wholly independent of the direction of the wind which it may present in the different points it traverses. In fact, observation points out that, in similar cases, the wind always moves like a vortex round a common centre, during the entire progress of the hurricane, in a circuit limited by the lateral extent of the tempest, and in a fixed direction, from left to right, that is, from west to south. Thus the general course of the hurricanes of the Atlantic seems to be that of the great marine current called "gulf-stream."—*Bibliothèque Universelle de Genève.*

CHEMISTRY.

CONGELATION OF MERCURY IN THE OPEN AIR AT GARDINER, MAINE, NORTH AMERICA. BY MR. HALL.—It was extremely cold on the 28th of January, 1817. A bed of charcoal was placed toward evening upon a quay, three hundred feet from any habitation. A little mercury was placed in blackened phials. The thermometer indicated -29° (-27° , 1, R.) at ten o'clock at night. At half-past three in the morning it altered to -32° (-28° , 4, R.). At half-past six it was -40° (-32° , R.). The mercury was fluid in the phials, but some drops which had been placed in a hollow cavity in the charcoal was partly congealed. When touched with a small stick, the mercury separated into angular and evidently crystalline fragments. This appearance, destroyed by the heat occasioned by the body of the observer, re-appeared at seven o'clock, but soon afterwards the rising of the sun put an end to the experiment.

SOLUBILITY OF OXIDE OF LEAD IN WATER.—M. Bonsdorff announces that oxide of lead, prepared by exposing the metal to a damp air, or even by decomposing with fire nitrate of lead, is entirely soluble in water. Seven thousand parts of water are required to dissolve one of the oxide, and the solution presents a powerful alkaline re-action, colours syrup of violets green, and is an excellent exciter of carbonic acid.

MINERALOGY.

CRYSTAL OF COLUMBITE OF REMARKABLY LARGE DIMENSIONS.—Some years ago a new source of Columbite was discovered inclosed in a mass of feldspath, near Middletown, U. S. The crystals found there have already been described in Mr. Shepard's *Mineralogy*, and "are remarkable," according to him, "for their regularity, their brightness, and their very large size. Some of them weigh from three to four ounces. The substances associated with the columbite are uranite, albite, and phosphoric lime." Very lately a still larger mass of columbite has been found in the same locality, it weighs 6lbs. 12oz.; the entire mass weighs 14lbs., but it was already much broken when taken from the bed. This piece, although sufficiently irregular, evidently forms part of a regular crystal, the incidence of whose faces might have been determined by the goniometer. In its interior are fixed pieces of feldspath and quartz, and some of the faces of fracture are bordered with uranite. The specific weight of this specimen is 5.4.—SILLIMAN'S *American Journal*, July, 1836.

BOTANY.

ON STIPULES.—Stipulæ are sometimes considered as distinct organs from the leaves, sometimes as accessories of the true leaves. The following passage, extracted from the second edition (London, 1835) of Dr. Lindley's *Introduction to Botany*, may tend to settle this question. "Nothing is commoner than to find (in Roses) a leaflet accompanying a stipule; and in a specimen of *Rosa bracteata*, which I have examined, there were no stipules, but in their place two pennate, exstipulate leaves. Consequently, stipules should be considered as leaves in a rudimentary state.—*Bibliothèque Universelle de Genève*, February, 1837.

COMPARATIVE ESTIMATE OF THE METEOROLOGICAL CIRCUMSTANCES UNDER WHICH CORN, MAIZE, AND POTATOES, VEGETATE AT THE EQUATOR AND UNDER THE TEMPERATE ZONE.—In comparing the results which he has collected, M. Boussingault* arrives at this conclusion: The number of days which separates the commencement of the vegetation of an annual plant is, in each climate, in inverse ratio to the mean temperature under the influence of which the vegetation takes place; so that the product of this number of days by the temperature is constant. This result, says M. B., is not only important as proving that the same annual plant receives throughout, during its existence, an equal quantity of heat, but it may also enable us to foresee the possibility of acclimating a plant in any country of which the mean temperature of the months is known.—*Compte rendu de l'Academie des Sciences, January 30, 1837.*

OBITUARY.

Mr. Edward Donovan, F.L.S., author of works on *British Birds*, *British Insects*, *British Fishes*, and on the Insects of India and New Holland, all splendidly illustrated, died February 1, 1837, leaving behind him a large family in destitute circumstances.

Henry Adolph Schrader, Professor of Botany at Göttingen, author of *Spicilegium Flora Germaniae*, 1794, and *Flora Germanica*, vol. 1st, 1806, and of various essays on exotic plants, has recently departed for another world.† His *Flora Germanica* has a high reputation, but it only extends through the class *Triandria*. There is an elaborate and very useful list of the botanical writers of Germany at the commencement. The *Flora Britannica* of Smith is spoken of in Germany as inferior only to the *Flora Germanica* of Schrader.

Adam Afzaleus, Professor of Botany at Upsal, and the Nestor of scientific men in Sweden, died January 30, 1837, aged 86. He was the last pupil of Linneus, and distinguished, like all the pupils of that great man, for his exact botanical knowledge. He is celebrated for his travels in Asia and Africa, and contributed two papers to the *Transactions of the Linnean Society*, "On the Botanical History of *Trifolium alpestre*, *T. medium*, and *T. pratense*, in 1798. Professor Afzaleus resided in Sierra Leone for several years, and published his principal work, *Genera Plantarum Guineensium*, in 1804. He also wrote several dissertations on the medicinal plants of Sierra Leone, besides some other works. His African herbarium is now in the British Museum. His younger brothers, John and Peter—the former devoted to Chemistry, the latter to Medicine—are both distinguished for their talents, and have, for nearly half a century, occupied chairs in the University of Upsal.

* In the *Bibliothèque Universelle de Geneve*—an excellent monthly miscellany—an interesting table of the results obtained by M. B. are given, to which we refer our readers for further particulars.—*Eds. An.*

† We should be glad if any correspondent could favour us with the exact date of the demise of Schrader.—*Eds. An.*

LITERARY INTELLIGENCE.

WORKS IN THE PRESS.

Memoirs of the Life of William Wilberforce, with portraits, by his Sons.

Life of Admiral the Earl Howe; from authentic manuscripts never before published; consisting of between four and five hundred letters in the Earl's own hand-writing, his private journal while at sea with his flag, several letters of his late Majesty, George III., to his family, and various communications from living Flag-officers who served under the Admiral's command, by Sir John Barrow, Bart.

Moore's Letters, Journals, and Life of Lord Byron; with notes, portrait and frontispiece.

Account of the Private Life, Manners, Customs, Religion, Government, Arts, Laws, and Early History of the Ancient Egyptians, derived from the study of hieroglyphics, sculpture, paintings, and other works of art still existing, compared with the accounts of ancient authors; illustrated by many hundred engravings in wood and stone, from original drawings copied by the author from tombs, during ten years residence, in Egypt, Thebes, &c.; by I. G. Wilkinson.

Remains of the late Lord Viscount Royston, with a Memoir of his Life; by the Rev. Henry Pepys, B.D.

Moorcroft and Trebeck's Travels in the Panjab, Ladakh, Kashmir, &c., countries, either imperfectly explored by European Travellers, or never before visited by them; with illustrations and a map: prepared for publication by H. H. Wilson, Professor of Sanscrit in the University of Oxford.

Travels in Arabia—in the Province of Oman, in the Peninsula of Mount Sinai, and along the Shores of the Red Sea; with maps and illustrations; by Lieutenant Wellsted, F.R.S.

The "Silurian System of Rocks," as developed in the Counties of Salop, Hereford, Montgomery, Radnor, Brecon, Caermarthen, and Pembroke; with sketches of all the accompanying formations, a large geological map, sections, views, and other illustrations; by R. I. Murchison, Esq.

Education in Holland, with special reference to the Schools for the Working Classes; translated from the French of Victor Cousin, by Leonard Horner, Esq., F.R.S.

The Plays of Sophocles, with Notes selected from the best Commentators, and abridged for the use of Students, with a Life of Sophocles; by the Rev. G. Woods, M.A.

A Flora of Jamaica; or a Dissertation on the Plants of that Island, arranged according to the natural Orders; with an Appendix containing an enumeration of the Genera according to the Linnean System, and an Essay on the Geographical Distribution of the Species; by James Macfadyen, M.D.

We believe Dr. Curie has in the press a work entitled *The Practice of Homeopathy*.

SELECT LIST OF NEW PUBLICATIONS,

From May 8th to September 8th, 1837.

-
- Alexander's Voyage to Western Africa, 2 vols. 8vo., 32s.
 Arundale's Tour of Jerusalem and Mount Sinai, 4to., 25s.
 Babbage's Ninth Bridgewater Treatise, 8vo., 9s. 6d.
 Bardwell's Temples, Ancient and Modern, royal 8vo., 21s.
 Bateman's Orchidaceæ of Mexico, folio, part i., 42s.
 Bivouac (Maxwell's), or Stories of the Peninsular War, 3 vols. post 8vo., 31s. 6d.
 Bell's History of British Quadrupeds, 8vo. 28s., royal 8vo. 56s., imperial 8vo. 84s.
 Bosworth's Scandinavian Literature, royal 8vo., 4s. 6d. ; Germanic and Scandinavian Languages, royal 8vo., 20s.
 Britton's and Wild's Lincoln Cathedral, 4to. 25s., large paper, 31s. 6d.
 Browne on Insanity and Asylums, post 8vo., 5s.
 Brydges' Moral Axioms for the Young, 18mo., 3s. 6d.
 Bushnan's Philosophy of Instinct and Reason, fcap 8vo., 5s.
 Cavaler's Specimens of Gothic Architecture, 4to. 63s., large paper, 105s.
 Cherubini's Course of Counterpoint and Fugue, by Hamilton, 2 vols. 8vo., 42s.
 Cochrane's Wanderings in Greece, 2 vols. 8vo., 24s.
 Cogswell's Essay on the Properties of Iodine, 8vo., 5s.
 Coverdale's (Miles) Letters of the Martyrs, 1564, 8vo. 10s., large paper, 14s.
 Cowper's Works, by Southey, 15 vols. fcap 8vo., 75s.
 Dana's System of Mineralogy, royal 8vo., 21s.
 Drury's Exotic Entomology, by Westwood, 3 vols. 4to., £6. 16s. 6d.
 Earl's Eastern Seas; or Voyages and Adventures in the Indian Archipelago, in 1832-3-4, 8vo., 12s.
 Evans' (Head Master of Bosworth School) Copies for Writing Greek in Schools, 4to., 5s.
 Fairholme's Geology of the Mosaic Deluge, 8vo., 16s.
 Falle's History of Jersey, by the Rev. E. Durell, 8vo., 15s.
 Fawckner's Travels in Western Africa, 12mo., 4s.
 Fearn on Demonstration of Vision in the Brain, 8vo., 1s. 6d.
 Gall's Physiological Works, 6 vols. 12mo., 32s.
 Giffard's Visit to the Ionian Islands, Athens, and the Morea, 8vo.
 Gleadall's Beauties of Flora, vol. 2, royal 4to. 50s., coloured 60s.
 Graah's Expedition to Greenland, translated from the Danish by G. G. Macdougall, with the Original Chart, 8vo., 8s. 6d.
 Granville's Spas of Germany, 2 vols. 8vo., 32s.
 Gray's Works, by the Rev. J. Mitford, 4 vols. fcap, 20s.
 Gray's Bard, with Illustrations, by the Honble. Mrs. Talbot, post 8vo., 7s.

- Gully's (Dr.) Exposition of Neuropathy, or Nervousness, 8vo., 6s.
 Gurwood's Wellington Despatches, 8vo.; Supplement to vols. 1, 2, and 3, 7s. 6s.; vol. 9, 20s.
 Hall's Theory and Practice of Medicine, 8vo., 16s.
 Hamilton's (Lady) Secret History of the Court of England, 2 vols. 8vo., 42s.
 Hand-Book for Travellers in Southern Germany, 12mo., 9s. 6d.
 Heraud's Voyages up the Mediterranean, post 8vo., 10s. 6d.
 Hippius's Chapters on Early English Literature, post 8vo., 9s.
 Hooper's (Dr.) Observations on the Topography, Climate, and Prevalent Diseases, of Jersey, 8vo., 6s.
 Hoskins' Visit to the Great Oasis of the Libyan Desert, 8vo., 21s.
 Hunter's (John) Works, edited by Palmer, with a Life of that celebrated Physiologist, 8vo., vols. 1, 2, and 3.
 Jackson's Lives of Early Methodist Preachers, vol. 1, 12mo., 5s.
 James' Memoirs of Celebrated Women, 2 vols. post 8vo., 21s.
 Jamieson's Mineralogy, according to the Natural History System, post 8vo., 6s.
 Jardine's Naturalist's Library, vol. 18 (Foreign Butterflies), 12mo., 6s.
 Ingram's Memorials of Oxford, 3 vols. 8vo., 58s., 4to. 110s., India, 160s.
 Jumps' Views in Calcutta, 4to., 10s. 6d.
 Laird and Oldfield's Expedition to Central Africa, 2 vols. 8vo., 28s.
 Lee's Translation of the Book of Job, with Notes, 8vo., 18s.
 Lewis's Illustrations of Constantinople, folio, 84s.; Sketches from Claude's Drawings, folio, 63s., proofs, 105s.
 Lindley's Ladies' Botany, vol. 2, 8vo. 16s., coloured 25s.
 Lockhart's Life of Sir Walter Scott, Bart., post 8vo., vols. 1, 2, 3, 4, and 5, 10s. 6d.
 Lowe on the Soil and Agriculture of Penang, 8vo., 12s.
 Luther's Commentary on the Psalms, translated by Cole, fcap 8vo., 5s.
 Macarthur's New South Wales, small 8vo., 8s.
 Macvicar, on the Beautiful, the Picturesque, and the Sublime, small 8vo., 7s.
 M'Kenney and Hall's Indian Tribes of North America, part I., 35s.
 Marigny's Voyages in the Black Sea to the Coast of Circassia, with plates and a map, 8vo., 10s. 6d.
 M'Carthy's Narrative of the Storming of Badajos, in 1812, 8vo., 5s.
 Macreight's Manual of British Botany, 12mo., 7s. 6d.
 Mayo's Remarks on Infant Education; 12mo., 3s. 6d.
 Nichol's Views of the Architecture of the Heavens, 8vo. 10s. 6d.
 Palgrave's Truths and Fictions of the Middle Ages, fcap. 8vo., 8s.
 Reid's History of the Presbyterian Church in Ireland, vol. ii., 8vo., 12s.
 Rhind's Elements of Geology, 12mo., 3s.
 Robinson's Travels in Syria and Palestine, 2 vols., post 8vo., 21s.
 Schröder's Turkish Grammar for Travellers and Merchants, 8vo., 6s. 6d.
 Shaw's Specimens of Ancient Plate and Furniture, from the Colleges of Oxford, 4to., 10s. 6d., folio, 42s. half-bound
 Shepherd's Life of Poggio Bracciolini, 8vo., 13s.
 Southey's History of the War in the Peninsula, vols. v. and vi., 8vo., 21s.
 Slade's Turkey, Greece, and Malta, 2 vols., 8vo., 31s. 6d.

METEOROLOGICAL REPORT.

169

- Spencer's Travels in Circassia and Krim Tartary, 2 vols. 8vo., 31s.
 Standish's Shores of the Mediterranean, 8vo., 8s.
 Stoddart's Angling Reminiscences, fcap., 5s.
 Thornton, on Diseases of the Ear, 8vo., 8s.
 Tiler's Natural History, 12mo., 5s. 6d.
 Transactions of the Royal Irish Academy, vol. xvii, 4to, 29s. 6d.
 Transactions of the Provincial Medical Association, vol. v., 8vo., 20s.
 Transactions of the Philosophical and Literary Society of Leeds, vol. i.,
 part i., royal 8vo., 10s. 6d.
 Transactions of the Linnean Society, vol. xvii, part iv., 4to., 24s.
 Transactions of the Royal Society of Literature; vol. iii., part i., 4to., 42s.
 Vogan's Bampton's Lectures for 1837, 8vo., 12s.
 Wach's Historical Antiquities of the Greeks, by Woolrych, 2 vols. 8vo., 30s.
 Walker's Philosophy of the Eye, small 8vo., 10s. 6d.
 Webster's Elements of Physic, 12mo., 9s.
 Whewell, on University Education, post 8vo., 5s.

METEOROLOGICAL REPORT.

JUNE.

1837 June.	Barometer.		Thermometer.		Remarks.		
	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.
1	29.480	29.580	64	50	Sun, clouds, wind	Showers	W. N. W.
2	29.518	61.5	46		Fine, cloudy		
3	29.500	29.551	57		Cloudy, showers		Northerly
4	29.566	29.646	67	40	Fine, light showers evg.	Fine	S. W.
5	29.664	29.628	64	53	Fine, distant thunder	Fine, cloudy	Westerly
6	29.664	29.714	62	47	Hot sun, cool breeze	Fine	N. N. E.
7	29.664	29.549	58	43	All sun, cool breeze	Fine	N. E.
8	29.449	29.348	56	38	Chilly breeze, fine	Cold	Easterly
9	29.300	28.988	63		Heavy rain afternoon		S. E.
10	29.038	29.014	62.5	50	Fine, windy	Showers	S. W.
11	29.202	29.352	62	51	Fine, sun, clouds	High wind	Westerly
12	29.380	29.266	60	51	Steady rain all morn.		S. W.
13	29.260	29.200	64	56	Cloudy, dark, showers	Cloudy	S. W.
14	29.278	29.450	67	57	Fine, hot sun	Cloudy	W. N. W.
15	29.488	29.464	69	50	Hot sun, cool airs	Fine	Northerly
16	29.442	29.352	74	55	Fine, thnd. storm aftrn.	Fine	S. W.
17	29.404	29.388	67	61	Cloudy	Cloudy	W. S. W.
18	29.268	29.378	66.5	53	Fine, cloudy	Wind	Westerly
19	29.412	29.394	67.5	54	Fine, sun, clouds	Cloudy	S. W.
20	29.354	29.440	66.5	55	Cloudy		S. W.
21		29.736		52	Fine, clouds, sun		
22	29.802	29.854	72	52	Fine, all sun	Fine	Southerly
23	29.830	29.822	74	58	Hot sun		Calm, vble.
24	29.780	29.668	73	57	Hot sun		
25	29.644	29.686	71.5	58	Hazy, clouds and sun	Fine	N. E.
26	29.684	29.744	65		Fine, sun		E. N. E.
27	29.730	29.696	62.5	47.5	Fine, sun	Clouds & stars	Easterly
28	29.686	29.672	68	48.5	All sun, hazy	Fine	Light, vble.
29	29.656	29.644	74	53.5	Hot sun	Fine	Calm
30		29.820	71	55	Fr. brz., sun, cls. & hze	Fine	N. E.
Mean Max. 66.8			51.0 Mean Min.				

JULY.

1887	Barometer.		Thermometer.		Remarks.			
July	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.	
1	29.838	29.894	63	48	Fine, sun	Cloudy, fine	Easterly	
2	29.780	29.768	69	45	Fine	Fine	N. E.	
3					Fine		Northerly	
4	29.686		69	56	Hazy, hot sun	Fine	Northerly	
5		29.614		55	Fine	Cloudy	Calm, W. rly.	
6	29.660	29.718	71		Fine		Northerly	
7		29.730	74	60	Hazy, hot	Fine	Calm, S.	
8	29.706	29.702	75	59	Fine, hot	Fine	Easterly	
9		29.546	65	53	Fresh breeze, sun	Fine	N. E.	
10	29.462		70	46	Fine, sun	Fine	N. E.	
11		29.472	72	52	Fine, sun	Fine	S. Easterly	
12	29.458	29.362	69	53	Fine, sun	Fine	Variable, lgt.	
13	29.390	29.290	72	56	Fine, sun	Light showers	Westerly	
14		29.330	72	56	Wind, cool			
15	29.322	29.400	69	58	Fine, shower	Showers	Variable	
16		29.550	68	52	Fine, sun		N. W.	
17					Fine, and showers	Showers	Westerly	
18	29.390	29.330	68	54	Fine, and showers	Showers	Westerly	
19	29.328		71	52	Very fine	Showers	Westerly	
20					Showers			
21		29.632	67		Hazy		Northerly	
22	29.600	29.580	70	53	Fine, clouds, sun	Fine	Westerly	
23	29.552	29.566	72	58	Fine	Showers	Westerly	
24	29.616	29.618	70	58	Fine, showers	Light showers	W. N. W.	
25	29.600	29.570	72	58	Fine, sun	Fine, stars	W. N. W.	
26	29.544	29.526	72	58	Fine	Showers	Calm W. N. W.	
27	29.462	29.290	73	58	Very fine		S. W.	
28		29.118	71	58.5	Very fine		S. W.	
29	28.654	28.704	64	55	Windy, showers	Heavy showers	S. W.	
30	29.020	29.326	63	53	Clouds and sun	Rain	N. W.	
31	29.390	29.340	66.5	50	Showers, clouds	Fine	S. W.	
Mean Max. 69.5			54.5 Mean Min.					

AUGUST.

1887	Barometer.		Thermometer.		Remarks.			
Aug.	Morn.	Even.	Max.	Min.	Day.	Night.	Wind.	
1	29.234	29.200	60	52	Cloudy, damp, rain	Rain	Calm, E.	
2	29.088	29.072	63	58	Heavy rain	Rain	S. W.	
3	29.020	29.200	66	54	Heavy showers,	Showers, wndy	S. W.	
4	29.354		63.5	51	Fine	Fine	Westerly	
5		29.748	64	46	Clouds and sun			
6	29.784	29.860	64	48	Cloudy	Fine	Easterly	
7	29.874	29.914	65.5	46	Clear, fine, sun	Fine	S. Easterly	
8	29.914	29.840	66	46	Hot sun, fresh breeze	Fine, wind	N. E.	
9	29.606	29.530	67	50	Fine, fresh breeze	Fine, wind	Easterly	
10		29.440	73	52	Calm, fine	Light showers	Southerly	
11	29.410			57	Sun, rain, clouds		Calm	
12		29.480	70	56	Fine, clouds, sun		Westerly	
13	29.644	29.704	72	53	Fine, clouds, sun		S. W.	
14	29.780		70	56	Fine, hot sun	Fine	Southerly	
15	29.806	29.802	72	57	Fine, hot sun	Fine	Northerly	
16	29.696	29.610	73	54	Fine, sun, clouds	Fine	Easterly	
17	29.584	29.582	72	59	Showers, thunder	Fine	Northerly	
18	29.660	29.700	72	61.5	Sun, clouds, haze	Fine	Calm, N.	
19	29.668	29.402	73	57.5	Fine, cloudy	Fine		
20	29.380	29.478	70	61	Cloudy	Shra. & lightn.	S. W.	
21	29.434	29.578	69.5	56	Fine, wind, and rain	Fine	S. W.	
22	29.660	29.630	65	53	Rain	Cloudy		
23	29.570		69	61	Rain in showers	Showers	Calm, E.	
24	29.760	29.780	60	48.5	Clouds and sun	Heavy Rain	N. E.	
25	29.735	29.560	65	48	Very fine	Clear aurora	S. E.	
26	29.420	29.586	62	54	Litng. & th, hvy. rain	Clear	Calm	
27	29.732		63	47	Fine	Clear, fine		
28	29.620		63		Fine, sun	Rain	S. W.	
29	29.084	29.060	60	51	Clouds, calm, rain	Rain	S. W.	
30	29.030	29.036	49		Clouds, light showers	Cloudy	Northerly	
31	28.990	28.924	59	44	Heavy showers, cold	Fine	Southerly	
Mean Max. 66.6			52.9 Mean Min.					

DIVI BOTANICI;

SKETCHES OF BOTANISTS WHOSE NAMES ARE COMMEMORATED
IN THE APPELLATIONS OF PLANTS.

ARTICLE THE FIRST.

IMMORTALITY of Fame as well as of Existence has ever been an object of intuitive aspiration in the Mind of Man; and it is this fondly cherished solicitude for attaining an everlasting celebrity that naturally assists in fostering motives to emulation in the exercise of his moral and intellectual powers.

With consciousness of possessing the innate sentiment which encourages an individual to hope that he himself may yet acquire an enduring reputation, or with the benevolent aim of strengthening in others the incentives to meritorious exertion, the Heads of Sects and the Rulers of Nations have usually displayed a generous promptitude to foster the desire of excellence by conferring the meed of a superlative glory on the wisest and the best of their adherents and compatriots, according to their estimate of worth and their judgment of dignity. Hence, from this source, erewhile arose the rite of Deification, whereby the primeval mythologists made gods of their sages and heroes; and, in after-times, with an object not essentially dissimilar, the process of producing saints began its course, and the work continues to be designated a Canonization. With a purer taste, however, and a sublimer gratitude, by devoting the names of discoverers to things discovered, the Naturalists create a more exalted renown for those enlightened Spirits who are fortunate in contributing to the advancement of their disinterested and truly philanthropical investigations.

Natural History includes many fair systems within its extensive domain: among the most fascinating of these, and the most innocent, is Botany: and the method of honouring the distinguished improvers of this divine Science, by appropriating their names to be appellations of Plants, is an object of virtuous competition, alike desirable as a reward of the excellencies it immortalizes, and venerable for the tendencies of its principle and the antiquity of its establishment.

Tradition associates with History in perpetuating the beneficence of those ancient Simplers who were thus rewarded for their success-

ful employment of the vegetable energies, as the means of healing injuries and diseases, in the days when Knowledge and Experience were but entering on their interminable career. With notes on the most remarkable of these illustrious personages, and on the salutary virtues of the herbs which are their emblems, an Introduction may be framed for the Sketches of Botanists whose names are commemorated in the appellations of Plants.

ARTEMISIA.—This celebrated female was the daughter of Hecatomnus, king of Caria, a country of Asia Minor, whose inhabitants, from their wealth and fortitude, were long distinguished as a very powerful nation, the metropolis of which was Halicarnassus, the birth-place of several philosophers renowned in the history of patriotic wisdom. Having conceived an ardent and sincere affection for her brother Mausolus, who was famous for his personal beauty, the princess afterwards became his wife, in conformity with the custom which sanctioned the union of brothers and sisters in marriage—a custom that necessarily obtained among the primitive occupiers of the earth, and thus was a chief cause from which the distinct Races of Men derived their origin.

Mausolus succeeded to his father's throne, and the prosperity of an industrious people made his reign fortunate, while his own happiness was enhanced by the purity of his queen's devoted attachment. But, like most other earth-born pleasures, this scene of comfort, though fair, was transitory. It closed with his death, which took place in the three hundred and fifty-third year before that wonderful event from which the Christian epoch dates its commencement. By this overwhelming bereavement, his widow was rendered forlorn and inconsolable; and, when his body had been consumed on a funeral pyre, she drank of his ashes suspended in a fluid potion. Resolving to erect an everlasting memorial to the name of her fondly bewailed husband, she engaged the emulation of learned men in promoting this aim of her conjugal piety, by the announcement of high and honourable rewards for the best elegiac eulogy on his character and attainments. In this strife of panegyric, the successful competitor was Theopompus of Chios: he acquired the reputation of an exact and eloquent historian; but, with the exception of some detached fragments, his compositions, including the pathetic funeral oration, have all perished from the records of literature. At the same time, and with the desire of preserving for ever from oblivion the object of Artemisia's affection, as well as the intensity of her own enduring sorrow for his dissolution, the widowed mourner constructed one of the grandest and noblest monuments of antiquity;

and, having designated it a *Mausoleum*, she consecrated the magnificent structure to his memory. It was a four-sided edifice, surmounted by a pyramid, having its summit adorned with a chariot and four horses; and, for ages, it was venerated as one of the wonders of the world.

Immediately on the demise of Mausolus, his munificent queen undertook the arduous offices of sovereignty; and, while thus discharging the duties of her high destiny, she displayed extraordinary wisdom, energy and patriotism, in promoting the welfare of her people, and in strengthening the resources of their country. But her spirit did not cease to be inly deadened by the gnawings of grief; and, in two years from the decease of her husband, she escaped from the cares of life and the fatal repinings of sorrow.

ARTEMISIA the Plant.—Considered as a generic term in Botany, the *Artemisia* comprises more than twenty species of vegetables, most of which are distinguished for their bitterness and strengthening properties. Five of these are indigenous to this Island, but good reasons may be found for believing that the common Mugwort was the plant which the Carian “queene adopted for her own herbe,” and administered it, with beneficial effects, as a remedy for diseases, particularly for such as are incident to the female constitution. The restorative powers of this plant appear to have been ascertained at an early stage in the practice of applying natural remedies; but, during the lapse of ages, many extravagant representations of its virtues were made by fanciful and credulous prescribers for the cure of sickness and wounds.

Originally this herb seems to have been known under the name of *Parthenis*, the virgin-flower, with reference to its efficacy in female affections. Afterwards, however, when it had obtained its existing appellation, this was speculatively regarded, by certain of the botanical historians, as betokening the patronage of Diana who, as the goddess Artemis,* received the adoration of her Grecian vo-

* According to Pliny, the prince of naturalists, “not men only and great kings, but women also and queens, haue affected this kind of glory—to giue names vnto herbes: thus queen Artemisia, wife to Mausolus, king of Caria, eternized her owne name by adopting the herbe Mugwort to herselfe, calling it Artemisia, whereas before it was named Parthenis.† Some; there be who attribute this denomination vnto Diana, whom the Greeks called Artemis Ilithyia, because the plant is of speciall operation to cure maladies incident to women.” He says, in another place, that “the Mugwort will preserue all those who haue it about them from witchcraft, sorcerie, and poison, from danger by venomous beasts, yea, and from the hurtfull and maligne aspect

taries. This notion may be set aside as gratuitous; but, whether the Plant derived its name from a deified maiden or a virtuous and enterprising matron, it might unquestionably be employed as an excellent medicinal agent, although now neglected, like many other valuable British vegetables, for no better apparent reason than the circumstance of its being readily obtainable and abundant.

CHIRON the Centaur.—When divested of the fantastic imagery under which he was mystically represented by the inventors of ethnic Mythology, this person appears as a munificent though unpolished patriarch among a pastoral people whom he essayed to benefit by the exercise of an acute natural sagacity, enlightened by high endowments of the perceptive and reflective powers. Having observed the salutary efficacy of a bitter herb upon the lower animals, he rightly inferred that it might determine equally favourable results in man. He instituted a trial, and the wisdom of his fore-drawn conclusion has been established by experience, both various and manifold. His name ranks high in ancient story, for his skill in music, archery, medicine, astronomy, and most of the polite arts; and, in these departments of science, he liberally communicated in-

of the very sun. The same, if it be taken in wine, helpeth and saueth those that are poisoned with opium: being either drunk, or worn about the neck, or but tied to any part of the body, it hath a peculiar vertue against the venom of todes."—*Historia Naturalis*, lib. xxv, cap. vii, x; folio, Venetiis, 1469: also *The Natural Historie of C. Plinius*, by Philemon Holland, M.D., folio, London, 1634; vol. ii, p. 222, 231–2. Marvellous and manifold are the powers imputed to the Mugwort: a copious enumeration of them is exhibited in Dr. James's *Medicinal Dictionary*, under the plant's botanical name. Bartholomew Glanville, who composed his work about the middle of the fourteenth century, observes, with characteristic quaintness, that "Artemisia is called moder of herbes, and was sometyme halowed by men of nations to the goddesse Diana that hyght Arthemis in Grece, for that the goddesse founde out the vertuous therof and taughte theym to mankynde; it driueth away fendes and withstondeth euyl thoughtes, and abateth feete ache that cometh of traualaile of goynge."—Bartholomej Anglicj de *Proprietatibus Rerum*, libri xix; folio, Lugdunj, 1480; lib. xvii, cap. xvi: Bertholomeus de *Praprietatibus Rerum*, translated into English by John de Trevisa; folio, London, 1535, p. 149. "To make a chylde mery, hange a bondell of Mugwort tagant, or make smoke thereof under the chylde's bedde, for it taketh away any for (fro) then. Agaynst payne of the heed called mygreynne or cephale, gyve some hot opiate in the decoccyon of Mugwert, and he that bereth it on hym in walkynge weryeth not. It is also good agaynst yll thoughtes, and stopeth the eyes that harmes, and all deuylllysshnesse fleeth fro the place where it is."—*The Grete Herball*, whych gyveth parfyte knowledge and vnderstandyng of all maner of Herbes; folio, London, 1529, cap. xxix.

struction to many eminent disciples ; but, beyond all the rest, Achilles, Hercules, Peleus, Jason, Aristæus, Theseus, Ulysses, Machaon, Podalirius, Æneas and Æsculapius, were the most illustrious.

Poetic history first recognizes the countrymen of Chiron as a tribe of herdsmen sojourning among the romantic uplands of Thessaly. By whatever name this people was designated in the Thessalian dialect, it has been immemorially known to the scholar skilled in Hellenic lore as a tribe of Centaurs* or *bull-prickers*, who hunted wild bulls on horseback, and tamed them to rural purposes, using *goads* as the instruments with which these powerful animals were subdued, and directed in the operations of pasturage and husbandry. Equally famous were this ingenious people and its chieftains for being the first to undertake the arduous enterprize of training war-horses and of managing them in battle, with terrible and destructive advantage over their antagonists. While they formed a new and distant object, the athletic Centauric archer and his steed would appear, to the fears or the fancies of alien tribes, as one prodigious animal ; and, thus excited by amazement, the wild enthusiasm of Ideality in their painters, sculptors and poets, forthwith engendered the formidable Monster, *half-man half-horse*, which constituted an expressive mystification of the dexterity and courage that should justly elevate the Centaurs of Thessaly to the praiseworthy distinction of having been the earliest equestrian knights, the intrepid Fathers of Chivalry.

Chiron was styled the "*Herbipotent*" and "*Æacidæ Doctor*," from his practical acquaintance with the properties of herbs, and his judgment in their administration ; for his love of justice and hospitality, he was revered as "*Senex Observatissimus Æqui*," the most upright and generous of his cloud-begotten† kindred : and, after his death, from a wound accidentally inflicted by a poisoned arrow, his proficiency in the astronomical mysteries was gratefully acknowledged by his translation into one of the zodiacal signs, in the figure

* Centaurs, Κένταυροι, so named *παρὰ τὸ κεντρεῖν τοὺς ταύρους* from their practice of pricking or goading bulls when training them for labour, or managing them on their pasture-grounds. They were worsted, in a drunken squabble, by the Lapithæ, a clan of their countrymen ; and, having insulted Hercules, they were exterminated by that hero as he was going to hunt the Erymanthian Boar.

† Nephelæ means a *cloud*, literally : it was a mountain of Thessaly, where the Centaurs resided ; and, being an upland pastoral region, it was often enveloped in clouds. Hence, from this natural feature of the climate, the Fable was fabricated—that the Centaurs were the progeny of Ixion by Juno, who admitted his embraces under the form of a cloud !

of a centaur, as *Sagittarius*—the bowman. Many of the Grecian states instituted divine honours to his memory; the Magnesians adored him with peculiar rites; and Hesiod composed an ode in praise of Chiron, the benefactor of mankind.

CHIRONIA *Centaureum the Plant*.—Here, the most instructed Man among the first men of a regenerated world, and the instructor of Men immortalized in the annals of primeval nations, Chiron the Centaur retains a two-fold tribute of veneration from being held in honourable remembrance by the *generic* and *specific* names of an Herb whose useful qualities have long been extensively recognized. This herb is the Common Centaury, the "*Sanctuaire*" of those simpling curers who make it efficacious, in a stomachic tea, for reviving the exhausted energies of digestion. Nature is bountiful in providing an abundance of native remedies in every habitable region of the globe, and in adapting them to the necessities of its inhabitants.

From the strength of the Bitter Principle which imbues it, the Centaury acts as a mild tonic medicine, producing favourable results in cases of debility or derangement of the functions of nutrition, and in some feverish affections. It also promotes the expulsion of worms from the bowels, and it has entered as an active ingredient into certain fashionable compositions for preventing or moderating attacks of the gout* in persons who are predisposed, by descent or habit, to suffer fits of this inveterate disease. Were the facts furnished by popular experience to receive the attention due to its value as a conservative of health, this well-approved Bitter would supersede most of the more expensive, but less efficient, drugs of the same kind, whose chief importance accrues from their exotic growth.

* Centaury forms the basis of the celebrated Portland Gout Powder, but in this state it should neither be taken in large doses, nor continued through a lengthened course. "Centaureia is a ryghte bytter herbe, and hight, therefore, the gall of the erthe; for one that hight *Achironcentaurus* founde and knewe fyrste the vertue therof."—Glanville. "Centorie was called in Greeke *Centauryon* and *Chironion*, after the name of Chiron the Centaure, who first of all founde out the herbe and taughte it to *Æsculapius*. The decoction of Centorie the lesse dronken, killeth wormes and driueth them forth by siege. The small Centorie greene, pounce and layde to, doth cure and heale freshe and newe woundes, and closeth up and sodereth olde malignant vicers that are harde to cure."—Lyte's *Nieue Herbal*; folio, London, 1578, p. 327. "The drynke that Centory is soden in, with sugre to delaye the bytternesse, is good agaynst opylacyon, or stoppynge of the lyver, of the mylt, of the reynes, and of bladder."—Grete *Herball*.

Nowadays, although it had obtained for centuries, the Chironia has been transformed, by the spirit of neological glossography, into an *Erythraea*, the *redling*, for reasons the propriety of which is unapparent. Many are the red-blossomed vegetables that make more conspicuous *Redlings* than the plant which has ever been held in hallowed estimation as the Herb of Chiron, since the days of old.

MELAMPUS.—Thirty-three centuries and more have completed their irremeable courses since the times when Melampus "*the Prophet*" overawed and benefited the early Peloponnesian tribes with wonders produced by the applications of his skill in moral and medicinal knowledge. Like the kings, priests and physicians of his days, he was a shepherd, and employed the leisure afforded by a pastoral life in pondering the system of terrestrial nature, and in contemplating the sublime economy of the "Host of Heaven." While thus devoted to the noblest intellectual exercises, favoured by seclusion and tranquillity, he regained that of the patriarchal wisdom by what he was qualified to sustain, the venerated character of a sage and a seer, and to secure for his name a glorious homage in the gratitude of after-generations.

This extraordinary personage appears, in ancient history, as the son of Amythaon the son of Cretheus, who was king of Iolchos at the period when Moses began to "keep the flock of Jethro his father-in-law," amid the mountains of the Arabian wilderness. Represented allegorically, Melampus had his dwelling-place at Pylos; and, while residing there, a knowledge of Poetry and Augury was imparted to him by the Divinity, through the instrumentality of serpents.* He descanted pathetically, in harmonious numbers,† on

* According to the apologue, Melampus had his ears gently licked by two serpents, while he was asleep during his infancy; and, by means of this mystical process, he received the gift of prophesying and that of interpreting the "language of birds." This allegorical legend originated in the widely prevailing belief, that these reptiles, which "were more subtle than any beasts of the field," possessed the faculty of presaging the atmospheric changes and the accessions of epidemical maladies. Hence it came, that the men of Argos revered the serpentine race as the "natural masters of the divinatory science," and never suffered one of them to be destroyed.

† Melampus was one of those primeval Melodists, whose names have survived "the wreck of ages and the spoils of time:" the "divine" Homer remembers him with marks of approbation. He composed many thousand verses on the *Sorrows of Ceres*, on the *Eleusinian Mysteries*, and on other themes; but all these have disappeared from the records of human action. From Apollo he derived an unequalled insight into the secrets of Physick; and, among the fooleries of modern "physiognomers," there is a tract of

the lamentations of Ceres over the adventure of her daughter Proserpine, who was "rapped" by Pluto from the beautiful plain of Enna, while botanizing there with her attendant nymphs ; and, by the institution of didactic rules, the Pylian sage instructed his disciples in the art of prognosticating the issues of disease, and of making their treatment prosperous.

Melampus retains the undisputed honour of having been the first to prescribe a mineral remedy, and to treat with perfect success that mode of "Melancholy without Fever" which is now designated Monomania or partial insanity whereby, from its insidiousness, the purest filial, parental or conjugal affection, too often has been inconsciously destroyed. He was no adept in the trade of "sending out the draughts ;" but, notwithstanding this happy ignorance, he had discovered the value of so disguising natural means with a veil of mystery as to procure for them the co-efficiency of a superstitious reliance on their powers. His "method of treatment" is exemplified in the "case" of Iphiclus, a Phylacian prince. With a view to this end, he made the sacrifice of two bulls his preparatory operation ; and, having divided their entrails into right portions, he congregated the birds, in order to execute an augury. Among the rest came a Vulture, and its omened flight revealed to the diviner that on a long-past occasion, when immolating an oblation of rams, the prince's father laid down the sacrificial knife near his son who, being yet a boy, beheld the weapon with dread, and hastened to deposit it in the cleft of a consecrated Chestnut-tree, where it became inclosed by successive layers of the bark ; and that, on the knife being reproduced and the rust* collected from its blade, if the invalid should drink of this in wine for ten days together, his acquisition of the desired energy would be certain. Iphiclus delayed not to enter on the course prescribed for him ; and, in due time, he was enabled to rejoice in the possession of vigorous manhood.

his on congenital discolourations of the skin, which is altogether spurious—the fiction of a delusive imagination. This piece, which nevertheless is a curiosity, has been several times printed both in Greek and Latin. It was translated into English by Thomas Hylle, and is appended to his "Contemplation of Mankind," with the title "A Treatise of the Signification of Moles, seene in any part of man or woman, written by a Greeke Autor named Melampus ;" 12mo., London, 1571.

* This is the first recorded instance of the carbonate (*sesquioxide*) of iron being exhibited as a tonic medicine. To this day, it continues to maintain its celebrity as a remedy for nervous disorders and debility. In the case of Iphiclus, the wine would co-operate with the iron, and facilitate the efficacy of its invigorating virtues.

Proetus held the sovereignty of Argos at the time when the Poet of Pylos was meriting an immortal eminence among the neighbouring nations, by his manifold endeavours to mitigate the sufferings and to enlarge the comforts of mankind, through the influences of beneficence and wisdom. This prince had three daughters, who were affected with an inveterate cutaneous eruption;* and, on its being accidentally, repelled the disease took a determination to the brain, and so deranged its functions as to induce a partial insanity.† Affected thus by a strong mental delusion, the princesses entertained the monstrous fancy that they themselves were *Cows*; and, escaping from society, they scampered away to the woodlands, where they filled the plains and forests with their wild lowings and their cries.

Melampus undertook the cure of these delirious damsels; and, for this purpose, he began with administering Black Hellebore,‡ as the best means, in his mind, for purging the bowels and the brain. He then subjected them to violent and protracted exercise,§ with

* Hesiod describes the affection of the Argian princesses by symptoms which distinctly indicate a case of leprosy. In them, he says, the head was covered with disgusting scabs, which caused an intolerable itching; the hair fell off in various places, producing patches of baldness; and over all their persons the skin was covered with lentil-shaped blains.—Eustathii, *Schol. in Odys.*, v, p. 1746; folio, Romæ, 1549.

† When Hercules was absent, at the performance of his labours, his wife Megara sustained an attack of personal violence by Lycus a Theban exile; and the matron must have been overpowered in the outrage if her husband had not returned at the moment, and punished the ravisher with death. This dreadful occurrence rendered Hercules so delirious that he killed his three children and their mother in a fit of madness, thinking them to be wild beasts. Another illustration of partial insanity results from the facts in this episode of the hero's history. This affection is prone to become infectious; sometimes it spreads epidemically among women having a sensitive and nervous constitution.

‡ Blacke Hellebor, taken inwardly, prouoketh the siege or stoole vehemently, and purgeth the neather part of the belly from grosse and thicke flemme and cholérique humours: also it is good for them that waxe mad or fall beside themselues, and for such as be dull, heauy, and melancholique.—Lyte's *Nieue Herbal*, p. 352. With Helleborum is a Watyr made that restoreth youth: such a one saw I my father haue: but such watyrs vexe the bodyes, and make a fallible image of youth.—Peter Morwyng's *Treasure of Evonymus*, p. 176, 4to; London, 1559.

§ Melampus has the credit of attaining this object by a contrivance which has probably never been imitated. He sent a number of robust boys who, by jumping and shouting, frightened the princesses and chased them as far as Sicyon, a distance of three leagues—a manœuvre well-calculated to re-

the effect of determining a profuse perspiration: and, last of all, to complete their recovery, he enjoined a course of bathing in the Thessalian fountain,* whose waters were long held in high estimation for their property of removing the scurfy, leprous and other sordid impurities of the skin. By this process of salutary discipline, the frantic maidens regained their health and equanimity; and the "doctor's honorarium" was the fairest of his fair patients, with a fair inheritance in her father's kingdom.

MELAMPODIUM the Plant.—Anciently this herb had the name *Hellebore*, expressive of its deleterious qualities on being inordinately employed. When the daughters of Prætus were delivered from their melancholy delusions by the agency of its evacuating energies, the name of their benefactor was bestowed upon the plant, as a tribute of grateful respect from the herbarists for his discernment and humanity. It continued for many ages after that event to be recognized as the *Melampodium*;† but, for reasons which satisfied Linnæus, the term now distinguishes a genus of exotic vegetables having characters every way dissimilar. The plant administered by Melampus was the *Black Hellebore* whose root, according to its proportions, has immemorially been regarded as capable of acting beneficially in dropsical, asthmatic, hysterical, epileptic, maniacal, and other nervous maladies, when these are unattended with fever, debility, inflammation or spitting of blood.

Pliny expatiates with amusing minuteness on the *Melampodium*,‡ giving an enumeration of its names, kinds, habitats and uses, both mystical and medicinal. Speaking through an English version, the naturalist commences with the inquiry "Who hath not heard of Melampus, the famous diviner and prophet? He it was of whom one of the Hellebores took the name, and was called Melampodium. And yet some there be who attribute the finding of that herb vnto

open the cutaneous pores, and thus to withdraw the causes of insanity from the brain.

* This was the source of the river Anigrus, to whose springs the qualities of a mineral water are ascribed. The Centaurs washed with it the wounds they received from the arrows of Hercules, in the reckless broil which led to the loss of Chiron's exemplary life.

† It was also called *Eutemon* and *Polyrrhizon*, sometimes *Veratrum*, but this last term generally denoted the *white hellebore*; and it is worthy of remark that the *Veratria*, a modern vegetable alkali, prepared from this plant, has precisely the same virtues attributed to it as those which were found to exist in the herb itself, according to the earliest records of the healing art.

‡ *Natural Historie of the World*, Tombe ii, p. 217-20.

a shepheard* or herdsman of that name, who, observing well that his she-goats feeding thereupon fell a scouring, gaue their milk vnto the daughters of king Proetus, whereby they were cured of their furious melancholy, and brought again to their right wits. The black Ellebore is a very poison to horses, kine, oxen, and swine, for it killeth them; and therefore naturally these beasts beware how they eat it. It commeth up euery where, but the best is in Helicon, a mountaine much renowned and praised for other herbs beside it, wherewith it is well furnished. The *blacke* Ellebore is called *Melampodium*, wherewith folk vse to hallow their houses for to driue away ill spirits, by strewing or perfuming the same, and vsing a solemne praier withall: it serueth also to blesse their cattell after the same order. But for these purposes they gather it uery devoutly, and with certain ceremonies:† for, first and foremost, they

* Although the grandson of a king, Melampus was a shepherd and herdsman, superintending the management of his flocks and herds in person, as did Abraham, Lot, Laban, Isaac, his sons and grandsons, whose trade had been with cattle from their youth, both they and also their fathers.

† According to the same industrious collector, nearly similar observances were practised by the Celtic Druids, in preparing the Selago, Samolus, Vervain and Mistleto, for religious and salutary purposes. "Many ceremonies," he says, "are to be observed in the gathering of this herbe, Selago (*Lycopodium Selago*, wolf's-foot, wolf's-claw, fir-leaved club-moss), which is much like unto Sauine. The party who is to gather it must be apparelled all in white; go barefoot he must, and have his feet waashed in fair water. Before he commeth to gather it he ought to do sacrifice unto the gods, with bread and wine: moreouer no knife or yron toole is to be vsed hereabout; neither will any hand serue but the right, and that also must do the deed not bare and naked, but by some skirt or lappet of his coat between, which was done off with the left hand, and so closely, besides, as if he came to steal it away secretly. Last of all, when it is gathered, wrapped up it must be, and carried in a new linnen napkin or towell. The Druids of France haue a great opinion of this herbe thus gathered, and haue prescribed it to be kept, as the only preseruative against all hurtfull accidents and misfortunes whatsoever; saying that the fume thereof is singular good for all the infirmities and diseases of the eies. The Druids also make great account of another herb growing in moist grounds, which they name Samolus (*Samolus Valerandi*, round-leaved water-pimpernel, or brook-weed); and forsooth if you did well you should gather it fasting, with the left hand in any wise; and in gathering not look back howsoever you do. In Gaule the Druids vse the Vervaine (*Verbena officinalis*, vervain, simpler's joy) in casting lots, telling fortunes, and foresheuing future events by way of prophesie. They giue expresse order that it be gathered about the rising of the great dog-star, but so as neither sun nor moon be at that time about the earth to see it; with this especial charge besides, that before they take up the herbe they bestow upon the ground where it groweth, honey with the combes, in token of satisfac-

make a round circle about it with a sword or knife, before they go in hand to take it forth of the ground : then the party who is to cut or dig it vp turneth his face into the east, with an humble prayer vnto the gods, *That they would vouchsafe to give him leaue, with their fauor, to do the deed* ; and with that he markes and obserueth the flight of the Egle ; for lightly while they be cutting vp of this root, ye shall see an Egle soring in the aire : now in case the said Egle flie neere vnto him or her that is cutting vp Ellebore, it is a certain presage and foretoken that he or she shall surely die before that yeare go about. It is wel known that Carneades the philosopher, purposing to answer the bookes of Zeno, prepared his wits and quickened his spirits by purging his head with Ellebore ; and Drusus, one of the most famous and renowned tribunes of the commons that were ever knowne at Rome, was perfectly cured of the falling sickness by this only medicine. It is good for the palsie, for those that be lunatick and bestraught of their wits, for such as be in a dropsie so they be cleare of a feuer, for inueterat gouts, as well of feet and hands as other joints. Physitians forbid the giuing of Ellebore vnto old folk and yong children, to such as be of a feminine bodie ; as also to those that be in mind effeminate ; likewise to those who are thin and slender, soft and tender ; least of all vnto those that spit or reach up blood ; no more than to sickly

tion and amends for the wrong and violence done in depriving her of so wor-thie an hearbe. They inioine them also who are to dig it vp, for to make a circle round about the place with some instrument of yron, and then to draw and pluck it vp with the left hand in any wise, and so to fling it aloft ouer their heads vp into the aire : which done, they appoint precisely that it be dried in the shade, leaues, stalkes, and roots, euerie one apart by themselves. They add, moreouer, that if the halle or dining-chamber be sprinkled with the water wherein Vervaine lay steeped, all that sit at the table shall be very pleasant, and make merrie more jocundlie. Of all other hearbes, there is none more honoured among the Romans than Hierobotane (the sacred plant, Vervain), called in Greek Peristerion, but which in Latin we name Verbenaca : it is that hearbe which our Embassadors vse to carry with them when they go to denounce war, and to giue defiance vnto our enemies. With this hearbe the feastivall table of Jupiter is wont to be swept and clesned with great solemnitie ; our houses also be rubbed and hallowed for to driue away ill spirits. Concerning the Misselto (*Viscum Album*, missel, all-heal), the principall and best is found upon the Oke ; it will work the better and with more efficacie in case it be gathered from the Oke the first day of the new moon ; also if it be not cut downe with any bill, hooke, knife, or edged yron toole. Moreover they do hold that, if it touch not the ground, it cureth those who are troubled with the falling sickness."—*Natural Historie*, ii, 178, 193, 228.

and crasie persons who haue some tedious and lingring maladie hanging vpon them." Here is a selectiōn from the curious and instructive notes of Pliny in his natural history of the *Melampodium*, as it was esteemed for a medicine by the ancients. He shows very clearly that, from observation and experience, the fathers of primitive families possessed much information concerning the nature and virtues of herbs; and, with many evidences, he also shows how soon the first tribes, misled by their patriarchs, degenerated from the simple worship of Him who created the Universe, while they brought debasement on the higher elements of Mind by the institution of fantastic and mystical rites as excitements to a spurious devotion. So prone is Man to invent superstitious observances, through a misuse of the intuitive sentiment that naturally disposes him to be religious.

TEUCER.—Legendary tradition prefers some claims to consistency when it uniformly selects the reputed disciples of Chiron the Centaur from among the cotemporary chieftains, notwithstanding the simple personal history of these unforgotten naturalists is densely encumbered with the ornaments of mythological and allegorical poetry. Like the rest, Teucer was fortunate in having "the wise and just man of Æmonia" for his instructor; and, profiting by the Centaur's precepts, he acquired a predilection for the exercise of his observant faculties in the examination of vegetable productions, so as to make them applicable to useful ends. With his parents, originated one of the first causes, and he himself was a high-spirited promoter, of that disastrous struggle which, "in the olden time," involved so many nations in misery, and occasioned so many heroes to be sacrificed at War's ensanguined shrine—the siege and extinction of Troy.

Teucer was the son of Telamon king of Salamis,* an island in the Ægean sea, with a capital bearing the same name. His mother was Hesione, the daughter of Laomedon king of Troy, whose faithlessness and ingratitude led to the first overthrow of that ill-fated city. He built its walls, and made vows with his supplications for divine assistance in the undertaking; but, when the work was completed, he stubbornly abstained from performing fairly his solemn

* Colouri is the modern name of this island, so famous for one of the most eventful naval conflicts recorded in ancient history. Ajax *Telamon* and his half-brother Teucer, who earned the highest reputation for valour and enterprise in the last Trojan war, were the sons of its sovereign. It lies opposite the southern coast of Attica, from which it is only a few miles distant: it is about fifty miles in circumference.

acknowledgment of the help he had received from heaven. For this impiety, his territories were laid waste by inundations of the sea, and his people suffered grievously from an epidemical pestilence. Penitential sacrifices were then ostentatiously offered by the royal transgressor; but, like the constrained abasements too often displayed by a justly chastised hypocrisy, they added mockery to the guilt of perfidiousness: they proved unavailing, and the calamities of his devoted nation increased. He was overmastered by the forces of an assailant* from the ocean, who demanded the annual tribute of a marriageable virgin, as the evidence of her people's subjugation to his power. For several years, this odious exaction had been endured, when the lot determined that Hesione, the king's daughter, should be the next victim. This fatal decision overwhelmed her hapless parent with consternation and wretchedness; and while with a natural reluctance he was hesitating to resign his tenderly beloved child to a destiny so cruel, he accepted the proffered aid of Hercules to liberate her country, and to punish its inexorable oppressor, engaging to recompense her deliverer with a stipulated number of the finest Trojan horses. Without delay the lady's heroic champion fulfilled his engagements, by achieving the monster's destruction; but, with the infatuation of a deceiver foredoomed to ruin, the false-hearted father refused to observe his part of the solemn compact, by withholding from his chivalrous ally the meed so entirely due to the saviour of his people from an intolerable degradation. Incensed most reasonably by the king's baseness, the ill-requited hero enforced his rightful claims by turning his power against the Trojan city which he captured, on the discomfiture of its army. He then put the insincere monarch to death, and established his son Priam on the dishonoured throne; and, having gained the princess Hesione among the spoils of war, he bestowed her on Telamon his trusty associate, who made her his queen, to share with himself the homage of his faithful Salaminian islanders.

Priam entered, with persevering energy, on the restoration of the Trojan metropolis, and he soon made it the admiration of many nations, for its extraordinary strength and beauty. But his prosperity

* With the poets this savage enslaver of the Laomedontiadae is mystically pourtrayed under the symbol of a sea-monster, by whom the destined Trojan maidens were mercilessly devoured. When divested of his emblematic horrors, this monster would be a barbarian pirate or "reafere," like the brutal Scandinavian "Se-kingr," who were long formidable to islanders and dwellers on the sea-shore, from the sternness of their valour and the ferocity of their vengeance.

proved unfavourable to his virtue, by undermining its supremacy in the economy of mind : it betrayed him into an attempt at injustice and ingratitude. His pride reminded him that his sister had been given to a hostile stranger, by the man who had desolated the inheritance of his fathers, and massacred the chiefs of its kingly race. Excited inly by this ungenerous feeling, he conceived a desire to re-demand the princess from her husband, with disregard of her affection for her children and their sire ; and, with a senseless unconcern about consequences, he dispatched his son Paris with a fleet so powerful as to render certain the indulgence of a solicitude alike unwise and unholy. This effeminate adventurer was kindly received by the Grecian princes ; but, encouraging an hereditary disposition to selfishness and profligacy, and neglecting the injunctions he was commissioned to execute, he did not perceive depravity in subverting the happiness of his august entertainer by an outrage on the rights of hospitality, which are sacred even among savages, on the laws of moral intuition, which are divine and immutable. By a stealthy crime he perpetrated the " Rape of Helen," which kindled the flames of a pitiless warfare ; and, in this, it was the hard fate of Teucer, the son of a Trojan princess, to have his prudence and fortitude exerted for the extermination of a people over whom his progenitors had long exercised a splendid and patriotic sovereignty.

When Teucer returned to Salamis from the Trojan expedition, his father would not receive him into his court and family, for the reason that the prince had not avenged the death of his half-brother Ajax,* who was killed in battle. In consequence of this unkindness, he repaired to Cyprust† where, on acquiring wealth and influence, he built a town, and conferred on it the name of his native island. After the death of Telamon his father, Teucer essayed to

* When Achilles was slain, Ajax and Ulysses supported opposing claims for the hero's arms ; and, on the dispute being submitted to the decision of Menelaus and Agamemnon, the pretensions of Ulysses were preferred. By this award, the son of Telamon was so enraged that he fell into a fit of maniacal fury ; and, during the paroxysm, he slaughtered a whole flock of sheep, imagining them to be the arbiters who had given him a position of gallantry inferior to that of his rival. This scene affords a melancholy illustration of partial madness occasioned by that disturbance among the mental faculties which awakens the passions of anger and pride.

† After the descendants of Teucer had continued to govern the Cyprian Salamis, and to guard the peace and prosperity of its inhabitants for more than eight hundred years, the town was destroyed by an earthquake. It was rebuilt and named Constantia in the fourth century.

vindicate his birth-right and to gain the throne ; but, on finding that his attempt would be ineffectual, he retired to his Cyprian Salamis, and there ended a life full darkly checkered with adventure and peril.

TEUCRIUM the Plant.—This herb's name prolongs the distinction of Teucer, as an honoured and original distributor of remedies which depend on the virtues of this vegetable for their effects. Recently arranged systems of Botany make the term represent a family of shrubs, under-shrubs and herbs ; and in this many kinds are included. Few of these grow spontaneously in this island ; they are the Germanders* and Wood-sages, to which the Ground-pine is an intimate ally. If Teucer took his medicines from plants comprised in this family, they would act as cordial and bitter restoratives adapted to the cases of persons suffering from loss of appetite, weakened digestion, nervousness and rheumatic gout. Sage-germander or Wood-sage possesses the bitterness, and has much of the flavour, of hops : it is sometimes used in brewing, and is not unwholesome ; but it imparts too dark a colour to the liquor. When, from necessity or accident, the Water-germander has been eaten by cows, their milk acquires the odour of garlick.

Although, in these latter days, the *Teucrium* denotes extensively the group of plants above-mentioned, yet the fitness of its application may be questioned, at least with respect to its originality. Pliny particularizes the herb which had its name in honour of the Prince of Salamis under the subsequent description ; and therefore, this being faithful, the evidence is conclusive that the naturalist speaks not of a Sage or a Germander. He says,† “ In the same age wherein Achilles liued, prince Teucer also gaue the first name and

* All the sorts of plants comprehended vnder the title of *Teucrium*, are doubtlesse kindes of Germander. They are not altogether without force or power to open and clense : they may be counted among the number of them that do open the liuer and spleen : when boiled in water and drunk, they deliuer the bodie from all obstructions and stoppings. There be Empiricks or blind practitioners of this age, who teach that with this herbe, *Asplenium*, *Ceterach*, or *Spleenwort*, not onely the hardnesse and swelling of the spleene, but all infirmities of the liuer also may be effectually and in a short time remouued, insomuch that the sodden liuer of a beast is restored to his former constitution againe, *that is*, made like vnto a raw liuer, if it be boyled againe with this herbe : but this is to be reckoned among the old wiues fables.—*Gerarde's Herball, or Generall Historie of Plants*, p. 657, 1141 ; folio, London, 1633. All this is a servile transcription from *Lyte's Niewve Herball*, p. 25, 113, and 408, with exception of the concluding judgment.

† Holland's *Natvral Historie of C. Plinius*, ii., 216.

credit to one speciall herb, called after him Teucrion, which some nominat Hemionium. This plant putteth forth little stalks in manner of rushes or bents, and spreadeth low: the leaues be small: it loueth to grow in rough and vntoiled places: a hard and vnpleasant sauer it hath in tast: it neuer floureth, and seed it hath none. Soueraigne it is for the swolne and hard spleene: the knowledge of which property came by this occasion, as it is credibly and constantly reported. It fortun'd on a time, when the inwards of a beast killed for sacrifice were cast vpon the ground where this herb grew, it took hold of the spleen or milt, and claue fast vnto it, so as in the end it was seen to haue consumed and wasted it cleane: here-vpon some there be that call it Splenion,* or spleen-wort: and there goeth a common speech of it, that if swine doe eat the root of this herbe they shall be found without a milt when they are opened. Some there be who take for Teucrium, and by that name do call, another herb full of branches in maner of hyssop, leafed like vnto beans; and they giue order that it should be gathered whiles it is in floure, as if they made no doubt but that it would floure."

Teucrium is neither mentioned nor described by Theophrastus, who was the friend of Aristotle, succeeded Socrates in teaching philosophy, and composed his *History of Plants* almost nine hundred years after Teucer had retired to the peaceful government of his Cyprian territory. In his days, therefore, this herb apparently had not yet become known to botanists by the name that honours its discoverer. Dioscorides flourished more than nine centuries after Theophrastus, and his *Books on the Materia Medica* bear a date an-

* This is retained as a generic term in the nomenclature of modern botany, with a slight but improving variation. It is the *Asplenium* or *miltwaste*, so designated with allusion to its reputed properties. Vitruvius describes the origin of the name in these terms; and, though founded on a fable, his deduction is instructive. "That we are beholden to the soil," he says, "for the wholesomeness of provisions both for man and beast, is demonstrable from the lands of the Cretans, which lie along the river Pothereus: sheep and black cattle graze on the right and left of this stream; but those which feed on the one side are not without a spleen, while those that pasture on the other side have no appearance of any. Hence physicians were led to investigate into the cause of this phenomenon; and they discovered an herb which the cattle had eaten, and which, by its virtue, had wasted away their spleen. They gathered this herb, and used it to very good purpose in disorders of the spleen. For this reason the Cretans called it *Asplenion*. Now," he concludes, "this example shews us that the natural salubrity or insalubrity of a place may be ascertained from the vegetables and water it affords."—*De Architecturâ*, lib. i, cap. 4; folio, Amstelodami, 1649.

terior to that of Pliny's *Natural History* ; but, during a part of their lives, these venerable Naturalists were cotemporaries. Each of them recognizes Teucrium as the established appellation of a plant which their predecessors had delineated, and also administered as a medicine. Very little difference occurs in their accounts of its characters and properties : of the two, the Greek physician discourses on his subject with the greatest brevity. His vegetable is not obscurely made a *Germander* : with Pliny, as has been noted previously, it is either a *Germander* or a *Spleenwort* : he abstains from proposing a distinction between them, as if his own views had been undetermined. Even through the veil of this uncertainty, however, the fact may be discerned, that an efficacious wild vegetable has been valued as the Herb of Teucer for more than three thousand years ; and it is a good taste whereby that Exquisite Sagacity which affects to know all things, and would reform every thing, has hitherto been restrained from out-stretching its desecrating hands to eradicate from the rolls of phytological glossography the name of an herb whereby the student of Nature's excellencies is reminded that the Son of Telamon was endowed with a disposition to promote the advances of humanity and intelligence.

A GENERAL VIEW OF THE SUBJECTS OF NATURAL HISTORY.*

IN commencing this Lecture, which is to include "A General View of the Subjects of Natural History," I may remark that Nature is a term comprehending all that exists so as to be perceptible by the human senses, without being planned by human contrivance or executed by human labour ; and in this its general meaning Nature stands opposed to Art.

The lessons of Nature abound every where : they come to us in the beams of the sun, in the cloud, and in the shower ; the ground we tread upon, the sky, the ocean, and the gentle air which fans the cheek, are all pregnant with instruction. Before any addition can be made to the accommodation or comfort of mankind, we must go

* Being a Lecture delivered before the Worcestershire Natural History Society, on the 3rd of October, 1837, by W. Addison, Esq., F.L.S.

to Nature for the materials, and to a knowledge of Nature for the methods of using them. All the most masterly combinations of the painter and the sculptor are but selections from the vast field of natural products. If he succeed in bringing together such an assemblage as no individual was ever known to exhibit, yet must the selection, in all its parts, follow the great outline and manner of Nature, otherwise, instead of a Venus or an Apollo, he would embody a monster.

Were I to bring before you any work of art in which genius had done its utmost, I could only shew you that the most perfect specimen of human ingenuity is but a faint and imperfect reflection of Divine Wisdom. The highest and noblest inventions of man can never stand the test of a comparison with the works emanating from the source of perfection. No parallel ought to be attempted between the works of Nature and the works of man. What are pyramids, that chronicle scarcely less than forty centuries, to your own neighbouring hills? What the most brilliant tints of the palette to the colours of the rainbow or the varied tints of autumn? What are the mausoleums of the east to the rocks and mountains that preserve the remains and memory of an extinguished world?

The works of Nature are so many and so varied—they include objects so beautiful and exquisite in their structure, and so perfect in all their adaptations—they are based upon principles so simple, yet so powerful, efficient alike upon the atom and the mass, now determining the orbits of comets and the career of planets through space to which we can assign no bounds, and again giving colour to the rainbow and the flower. The vast extension of Natural History, and its endless application to the wants of man, raises it so high in the scale of our inquiries and pursuits, that every attempt to impart its facts and conclusions in an easy and persuasive form is desirable and praiseworthy. To this end the building in which I am speaking, placed in the centre of your city, has been devoted; for this purpose its museum is stored with materials of interest, which cannot fail of imparting a feeling of surprise and admiration to those who visit them. Do not be disappointed if you cannot make out the object or uses of all you see; to understand any department a previous acquaintance with the labours of others is necessary. The energy of many minds has been exerted in the study of Natural History; and the limits of former discovery should be the starting-post for you.

Among the primary elements of education is the acquirement of the art of imparting to others all that may be passing in our own

minds, our thoughts, our wishes, and our wants. The organs of speech are limited to personal communications ; they cannot convey our ideas to persons at a distance from us, much less are they able to transmit them to those who may come after us. But man has succeeded in establishing a permanent channel of communication. I take up my pen, and in a few minutes can exhibit in intelligible characters to all around me every thing that has been passing in my mind. The results of years of laborious research, of long and wearying thought, can at once be placed before thousands by the press. Thus every new view—every new discovery in Natural History—every inquiry that has occupied the attention of a life—is submitted to the world, where it is canvassed, verified, or corrected. Contemporaries and posterity, instead of recommencing the investigation, begin where it terminated ; every step is secured, and the thoughts and actions of a man's life, become beacons for the guidance of his successors. Without these means a knowledge of the various productions of Nature could not have extended far ; as it is, they have given a vast impulse to the study in this country : to the publications in France, and to those of the immortal Cuvier especially belong the credit of this impulse in the departments of recent and fossil Zoology.

It does not fall within the scope of the present lecture to enter into the details of Natural History ; but I shall endeavour to bring before you the primary divisions of the subject, and to exhibit some of the interesting objects they severally embrace.

At the head of animated beings stands man. Observe him in his social and in his uncivilized state : mark the effects produced by the activity of his reasoning powers ; his habits from infancy inclining him to look to others of his species for his pleasures, consolation, and support ; thus impressing on his character the feelings of parental love and the desire for social intercourse. His passions tempered by civilization : and the curious contemplations of an aspiring intellect subdued and harmonized by religion. From man turn your attention to the several tribes of animals with habits and instincts often superior to his own, with senses in no way inferior ; capable of enjoyment, of attachment, and dislikes ; sensible to pleasure and amenable to pain ; but devoid of those intellectual powers which add the delights of contemplation and hope to the love of life.

From quadrupeds pursue the stream of vitality through birds of every size and every hue, from the Eagle soaring above the tops of the mountains, and the gigantic Crane stalking upon the arid plains of India, to the Humming-bird fluttering from flower to flower, sip-

ping their sweets ; from the Vulture to the gentle Wren. Between these extremes, what beauty in form and plumage ! What variety in song and habits ! The air is often filled with the warbling tribe ; the groves and thickets on every side resound with their notes of joy and affection.

The waters, again, are full of activity. The ocean teems with life : fish of every kind—the Whale, the Lobster, and the Shrimp. Every reef is bristling with corals and sponges, and every tide-washed rock is carpetted with fuci, or studded with *Actinixæ* and *Molluscs*. Then, again, the insect tribe, with their wonderful metamorphoses. From insects, the simpler forms of animal life are found in *Worms*, *Infusoria*, and *Entozoa* ; until at last we are conducted to the confines of another scene, where the organisms of animal life are hardly to be distinguished from vegetable structures. This boundary passed, we ascend upon another scale to forms far different, but singularly beautiful, and quite as varied—the stately Oak, the Palm, the Mushroom, and the Lichen. Every blade of grass, every weed, exhibits a structure maintaining the functions of vegetable life, by which the materials of nourishment are drawn up from the ground, sent through millions of little pipes or tubes into the leaves, and in returning promote the growth of the individual, and secure the further propagation of the species by perfecting the seed.

To such an endless assemblage of living forms, you may well suppose that a great deal of learning, a great deal of observation, and an immense amount of mental labour has been devoted, for the purpose of their arrangement and classification ; and as a system of classification is essential to the study of Natural History, I must detain you with a few remarks upon the matter. Naturalists, in the present day, are actively engaged in studying all the minute parts of animals and plants, both internal and external ; so that their affinities and alliances in the great connected chain of Nature may be determined, and their true place in a *natural system* fixed. In this way the habits of animals and the sensible properties of plants are best associated, and their organization elucidated with the greatest accuracy. But this, which is the *natural method*, requires great industry and an extensive knowledge, and, I may say, is yet in its infancy. A vast deal has been done, but much remains to be accomplished ; many links in the chain are wanting, and, unfortunately perhaps for *amateurs*, a host of hard names derived from the Greek are employed as terms of designation, and they have not given

an inviting aspect to the study. All this, perhaps, may be improved.

The Linnæan methods of classification are undoubtedly the easiest ; but, based upon insufficient data, and looking chiefly to isolated facts, they have not that bearing or dependence upon those general views which are now taken of the kingdom of Nature. These methods have, therefore, been called artificial schemes ; but this is not an appropriate term to bestow upon a system of classification which, however imperfect our increased knowledge of Nature may shew it to be, has done, and will yet do, a great deal in promoting a taste for Natural History, by presenting an easy and inviting introduction to a wide and difficult study. But Linnæus was the first to point out the desirableness of the natural method, indicating it as a pursuit worthy of a philosopher, though he thought it would be too difficult for the young scholar, because it depends upon such an extended series of mutual relations as can be understood only by a comprehensive view of the whole of the animal, vegetable, and mineral creation. The interpretation of Nature in her innumerable forms is, indeed, no easy task ; and even now—as will always be the case in so vast a field—differences of opinion exist, controversies and discussions are going on upon many points ; so that to the young naturalist there appears to be great difficulties in the study. All these, however, are more apparent than real. It must be remembered that as yet a part only of a great system has been discovered ; therefore, discussions and differences of opinion are the means—the necessary means—for finding out that which is not, and for stamping a true value upon that which is, known.

I mention these things that you may not be discouraged by entering upon the study of Nature at a period of excitement and great change, while the workmen are all variously engaged upon detached points, and while, as yet, little seems securely settled. Remember that the proportions and beauty of a structure are hardly to be made out while surrounded by a mass of materials, and before those which are not wanted have been cleared away.

The great truths of progressive development throughout all organized beings, and the very gradual transition of the simple into the more complex forms, are now firmly established and agreed to on all sides : the difficulties lie in separating and characterizing particular groups, for the purposes of classification, from those which stand on either side in the extended chain of being.

A system of Natural History will include Zoology, Botany, and

Geology or Mineralogy.—Zoology embraces the whole animal kingdom; and, looking to the organization of every species, it is naturally divided into four great divisions. The first division (*Vertebrata*) includes all those animals which have a vertebral column or spine, supporting an internal bony skeleton. The second (*Mollusca*) have no internal bony structure; on the contrary, they are clothed externally with a shell or dense tunic, and are chiefly inhabitants of the ocean. The third division (*Articulata*), so called because the different portions of their body are composed of moveable pieces articulated to each other, differ from Mollusca in generally possessing a skeleton, and from Vertebrata by the skeleton being external, and not internal. The fourth division (*Radiata*) differ from the three preceding in the greater simplicity of their structure, and in the almost total absence of any thing like a nervous system.

Botany embraces the whole of the vegetable kingdom; and referring to the organization of every species, it is naturally divided into two great divisions, *Vasculares* and *Cellulares*. Vasculares have a vascular and cellular structure, with delicate spiral vessels in their tissue; they have a sexual apparatus, and are propagated by seed. Cellulares have a cellular structure only, are destitute of spiral vessels, without any sexual apparatus, and the plants included are not propagated by seeds. If we proceed to investigate the structure of the great division Vasculares, it is found distinguished, by a truly natural character, into two sub-divisions; the one including plants which grow by the addition of new matter on the outside of the old (*Exogenæ*), and the other those which grow by the addition of new matter in the centre of the old (*Endogenæ*). Exogenous plants have a structure composed of a central pith, an external cellular or fibrous ring or bark, and an intermediate woody mass, well-illustrated in a young shoot of Elder. Endogenous plants, on the other hand, have neither bark, nor pith, nor wood, but are made up of tubes and fibres imbedded in cellular substance, as in the Palm, the Cane, and Bamboo. Again, in *Exogenæ* the seed is *dicotyledonous*, and the veins of the leaf are variously netted; in *Endogenæ* it is *monocotyledonous*, and the veins of the leaf are parallel. It is thus we look to structure and physiology for the first lines of a natural method of classification, both in animals and plants; and you will find all the standard works upon Natural History which have been lately published adopting these views.

I now refer you to the following classification of the several tribes of animals; and, commencing with the simplest forms, shall

endeavour to illustrate my remarks by reference to various specimens from the museum.

Radiata.—Polygastrica, Poriphera, Polypiphera, Acalepha, Echinoderma.

Articulata.—Entozoa, Rotifera, Cirrhopoda, Annelida, Myriapoda, Insecta, Arachnida, Crustacea.

Mollusca.—Tunicata, Conchifera, Gasteropoda, Pteropoda, Cephalopoda.

Vertebrata.—Pisces, Amphibia, Reptilia, Aves, Mammalia.

If we place a drop of any decayed infusion of animal or vegetable matter under a powerful microscope, and pass a ray of light through it, we discover in that drop various forms of living beings : some of a rounded, some of a lengthened form ; others exhibiting various ramifications ; but all apparently of a soft transparent texture. These singular animals abound in the stagnant waters of rivers and lakes, and are found in every drop of the ocean. They are called Polygastrica, because, under a very high magnifying power, they are observed to have several internal cavities or stomachs. Although crowded together by thousands, their motions seem to be regular and methodical ; and they are seen to advance, recede, and stop at pleasure.

Inhabiting the shores of the sea, covering the rocks, and sometimes hanging in branches from the cliffs, are the sponges and various sponge-like bodies. They are termed *Poriphera*, from the innumerable pores, canals, and tubes, of which the firmer textures of the body consist, and through which the salt-water is found constantly circulating. When these sponges are torn from the rocks the softer parts of the animal run down like oil. If at this time we cut the sponge in pieces, the salt water may be seen, under the microscope, rushing through the pores and canals of each separate piece, although we can observe nothing in the structure to explain the motion. The strongest stimuli fail in exciting the slightest movement ; strong acid or a hot wire does not cause the slightest trembling : yet the usual currents still go on.

The *Polypiphera* inhabit the sea in every clime. These beautiful varieties of coral and corallines now before me are the skeletons of polypipherous animals, which ramify and branch out in masses from the bottom of the sea. Sometimes covering these elegant masses are thousands of little carnivorous animals ; sometimes in the interior there is a soft fleshy substance, which is the body of the animal. These *polypiphera* are an exceedingly interesting group, well worthy your attention.

The *Acalepha* are, for the most part, gelatinous animals, inhabiting all parts of the ocean. They are generally transparent, and of a very simple structure; for instance, the *Medusa* and *Physalia*. They all excite a tingling or stinging sensation when they touch the skin of man: hence the name of the family. Among the *Acalepha* are many animals of great size, swimming freely through the sea by their own exertions, possessing a complex digestive apparatus, and having, for the most part, numerous long and exquisitely sensitive tentacula. There are others, as the *Actiniæ*, which are fixed.

The *Echinoderma* are also marine animals. The *Asterias* (Starfish), *Echinus* (Sea-egg), and *Cidaris* are types of this curious family, specimens of which are before you, many of them with their natural spiny covering. The large fossil tribe *Crinoidea* (Encrinites, Pterocrinites, and others), which you may study hereafter in the museum, is composed of fixed individuals belonging to this family.

With regard to the anatomical structure of these simple Radiate animals, we find a homogeneous more or less transparent body; sometimes, as in *Polygastrica*, divided into distinct little sacs or stomachs; sometimes (in *Poriphera*) supported upon a flexible elastic sponge; at others (*Polypiphera*) upon a hard calcareous skeleton: but we find nothing like nerves—the peculiar characteristics of a higher order of development—in any of these animals. Nerves first begin to appear in *Acalepha*: and in the *Echinoderma* we observe a distinct nervous filament, and the first appearance of muscular fibre.

Frequently found in the interior of the best-protected organs of the higher animals—in the liver, the muscles, the alimentary canal, and even in the substance of the brain—are various species of parasitic worms, belonging to the class *Entozoa*. Upwards of fifteen distinct kinds are known to infest the human body, where many of them give rise to well-marked symptoms of disorder—for instance, the *Ascarides*, Tape and Guinea Worms. A very minute *Entozoa*, enveloped in a cyst, has been lately discovered in the dissecting-room of St. Bartholomew's Hospital, existing in astonishing numbers, imbedded among the fibres of the voluntary muscles of the human body. They appear to breed and exist in the living flesh, without giving rise to any symptoms yet known. Classed with these *Entozoa* is a singular, long, hair-like animal, inhabiting ditches, called the *Gordius aquaticus*, from the complicated knots they are capable of forming with their long slender body. I notice it particularly because many persons, not versed in Natural History, think it is merely a horse-hair animated by being steeped in water; and some

will tell you that they have seen the hair grow into a living worm. It is a curious fact that many fish are infested with various forms of Entozoa, which attach themselves upon the lips, eyes, and other tender organs, by means of a little hook developed near the mouth.

The *Rotifera* are minute microscopic animals found with the *Polygastrica*, but removed from them in the classification we have adopted, because their organization is more perfect and complex. The *Cirrhopoda* are inclosed in shells of carbonate of lime; all timbers exposed in the sea, and the broken utensils and instruments thrown out from vessels at anchor, are soon covered with them. Many Cirrhopoda are found adhering to the backs of Whales and Porpoises. The Common Barnacle and several species of *Lepas* now before me, will serve to illustrate this curious family.

Inhabiting the soils of all continents, and burrowing by millions into the sands of the sea shore, are various species of worms, constituting the class *Annelidæ*. The beauty of the forms, the structure, and the colours of many of these worms are not exceeded by those of any other animals; and their astonishing numbers render them important in the economy of Nature: they display as much the hand of the Great Artificer and are as perfect for their objects as man himself. The time is now past for ignorance to sneer at the anatomy of a worm: to overlook any of the links in the great chain, or to attach insignificance to any particular stage in the general process of vital development, would betray a gross indifference to the more interesting and philosophical parts of Natural History.

If you examine the Common Earth-worm, which may be taken as the type of the *Annelidæ*, you may see that it is surrounded by rings extending from one extremity of the body to the other, and you may detect by a close examination *eight* very short, pointed, tubular *feet* attached to each ring or segment: by the naked eye they can hardly be perceived, but you may feel them with the finger and see them by the aid of a lens. In the next class, *Myriopoda*, the legs are much more developed and the segments of the body more conspicuous; for example, in the Centipede. *Insecta* is a very large and interesting class, including all those animals which undergo metamorphosis from a caterpillar to the chrysalis, and from that again to the perfect form: Moths and Butterflies, Wasps and Bees, are sufficiently familiar examples. Allied to insects are the *Arachnidæ*—Spiders, Scorpions, &c. These are distinguished from insects by being destitute of antennæ, they have no wings, and are not subject to any metamorphosis.

Fossil *Myriapoda*, *Insecta*, and *Arachnida* occur in great numbers

in bituminized vegetable resins or amber, in the tertiary calcareous slates, and in gypsum ; many fossil insects are found in the brown coal and bituminous marl slate. The accordance of these extinct forms with those now existing, and the narrow limits of their variations, shew in an extraordinary manner the unity of plan which pervades every department of the animal kingdom. We find just the same system and harmony in the laws which regulated the formation of these beings thousands of ages ago as are now manifested.

The *Crustacea* may be called the spiders of the sea: the Lobster, Crab, and Shrimp are sufficiently known to you. Many of the species in this class are very agile and sprightly: and although the mode of progression in the Lobster and the Shrimp is tail foremost, still they are capable of taking an extensive spring, the former bounding to a distance of thirty feet by one or two sweeps of the tail. Perhaps the most interesting fact I can mention respecting these crustaceous animals is that of their periodically casting off their shelly covering. The old shell is removed in detached pieces, the animal escaping from it with a soft newly-formed epidermis, which soon secretes the earthy matters to form a new shell, thin layers being deposited in succession until the animal has formed for itself an entire jointed sheath, corresponding with the increased magnitude which it assumes at each fresh casting of the shell. Many interesting forms of fossil *Crustacea* are found in the London clay. The crustaceous animals complete the second grand division of the animal kingdom.

The simplest family of the molluscous animals is the *Tunicata* ; so called from their soft transparent external covering. These animals are closely allied in their structure to those inhabiting *bivalve shells*. They are often found thrown upon the shore by the agitated states of the sea. The *Tunicata* frequently cover themselves with an adventitious solid earthy matter formed of particles of gravel, shells, or mud. The beautiful little *Pyrosoma*, myriads of which contribute to illumine the ocean at night, especially in tropical regions, is one of the class *Tunicata*.

The *Conchifera* include all the inhabitants of bivalve shells. In the study of Zoology, as now pursued, these shells and their architects must be considered together ; and Conchology, as formerly understood, can hardly be considered as forming any part of Natural History, unless we allow that it embraces what the French call *Malacology*—that is a history of the animals which the shells inclose. The Linnæan Conchology may be very useful to persons collecting shells as beautiful objects of creation ; but when we wish to study

Nature, we cannot overlook the animal which is their sole architect. The shells of the more abundant species of Conchifera sometimes form the entire line of beach along the sea shore for miles, and in many places they are burnt for lime. The *Teredo navalis* bores by means of its shells into the hardest timber, and the genus *Pholas* buries itself in the hard rock. Many shells of Conchifera are here before you, and they display great beauty in their forms and colour. The recent, waved, and inner layers of the shell are generally more pellucid, have greater lustre, and are more transparent than the exterior layers, which have been longer acted on by the water and by the sand and gravel which wash over them. Upon removing the outer layers, we often obtain the remaining inner portions of a beautiful pearly lustre, constituting in fact mother-of-pearl.

Pearls are formed by conchiferous animals. A little particle of sand, perhaps, gains access between the mantle of the animal and the last formed layer of the shell, the irritation it creates causes the nacrious matter to be thrown out, and successive layers being deposited a pearl is formed. The Chinese have a practice of forcing the Swan Muscle to make pearls by throwing into its shell, when open, three or four very small mother-of-pearl beads: in the course of a year or two they are found covered with a crust perfectly resembling pearls.

Animals inhabiting univalve shells are termed *Gasteropoda*, because, like the Common Snail, for example, they creep upon a muscular disc which extends along the lower surface of the body. Gasteropodous shells are, many of them, very splendid and exceedingly varied in form and size. Immediately beneath the shell is the mantle of the animal by which it is secreted, and when the shell is broken the mantle has the power of repairing it.

Closely allied, in many respects, to the three last tribes are the *Pteropoda*, small delicate animals, swimming together near the calm surface of tropical seas by means of curious wing-shaped membranes, from which they derive their scientific appellation.

The *Cephalopoda* approach nearest to fishes. The name is derived from the circumstance of the feet of the animal closely surrounding the head. Several of the *Cephalopoda* inhabit a peculiar kind of shell, composed of a series of chambers, and constituting a multilocular or polythalamous shell; for instance, the Argonaut and the Nautilus. The *Sepia officinalis* is a very remarkable cephalopod animal. The family is an extensive one, and will prove highly interesting to those who have opportunities of studying it. Among

the fossil shells which formerly belonged to animals of this description, the Ammonite is the most remarkable. Here are several fine specimens of fossil Ammonites: all the connecting calcareous matter has been removed from the septa, and the different chambers have been filled by an infiltrated stony material, with serrated and dovetailed margins. Upon looking at them in this loose detached condition, they look very like vertebræ, and they have by some been taken for the vertebral columns of Serpents. The animals to whom these shells belonged are entirely extinct. Although four hundred distinct fossil species are described by naturalists, and more than one hundred of these are met with in our own strata—although they sometimes occur in such abundance that whole rocks are composed of little else—yet *not one living individual* is now known to exist on the face of the earth. Large specimens of Ammonites are sometimes built into the front of houses, particularly in Somersetshire and Yorkshire, and they are looked upon by the peasantry as petrified Snakes. You are not to conceive that in these enormous remains of the Ammonite you are looking upon the testaceous covering of the animal: this has been entirely removed, and you observe a cast of the interior of the shell only.

We are now arrived at the important division, *Vertebrata*. The first class is the *Fishes*; the next the *Amphibia*, comprehending Frogs, Toads, &c. This is a deeply interesting family, embracing beings changing, in all their internal machinery, from their aquatic condition, to beings which live and breathe in the atmosphere—undergoing a metamorphosis which affects their osseous, vascular, nervous, and even their digestive systems—changing, in fact, their whole structure.

Reptilia comprehends the different kinds of Serpents, Crocodiles, Lizards, and Tortoises. These are the last of the cold-blooded animals; they do not undergo any metamorphosis—a character so prominent in the preceding class. Many of the secondary rocks, especially the Lias Limestones, abound with remains of extraordinary and gigantic reptiles, which appear to have abounded in the former seas and estuaries of the globe.

The next class, *Aves*, is the first of the hot-blooded animals. Here is a beautiful and interesting department of Natural History: we all derive pleasure from reading an account of any observations on the habits, migrations, and plumage of birds; and you will be gratified to learn that Ornithology is likely soon to boast of an association of naturalists who will pay particular attention to every thing relating to it. The London Ornithological Society propose

forming extensive gardens, in one of the public parks, for the display of foreign and indigenous birds of all kinds.

The class *Mammalia* is too well known to require from me any examples. I will now ask you to pause for a moment, to connect the various objects presented to your notice, and the whole animal kingdom is before you, forming a grand and harmonious picture. Extend your mental vision to the Heavens, and what another glorious scene! The imagination here may wander through endless realms of space, occupied by masses of matter, in magnitude and rapidity of motion surpassing the powers of our finite comprehension. If you ask their size, or try to measure them by magnitudes within your reach, the attempt is hopeless. All the animated beings on the earth, its forests, and its mountains, bear no greater relation to its size, than the bloom upon a plum. And then, again, the globe itself, with all it bears upon it, is lost in the greater immensity of the heavenly bodies. If you ask of what materials these bodies are composed, with what forms of living beings they are peopled, reason, philosophy, and science, return no answer. Your imagination may picture from analogy the purposes for which they were created, and may people them with myriads of living forms; but how poor, how insignificant, is your attempt to scan or comprehend the works and designs of Infinite Power, exerted with endless duration in infinite space!

LOOSE THOUGHTS ON THE CAUSE OF BEAUTY, &c., IN ARCHITECTURE.

In this enlightened age there is something eminently ridiculous in a person (fancying himself in advance of his fellows in intellect and knowledge) publishing his lucubrations with all the solemnity of an oracle, and appearing ready to burst with the magnitude of his discoveries, when, in fact, all his sublime thoughts are shared by thousands.

When we reflect on the great number of public buildings which have pretensions to beauty and design, but which are so various in form, and so diametrically opposite in the principles of their composition—even in those intended for similar purposes, which ought certainly to have some similar expressions—we must perceive the

want of some analytical principles to guide the architect in designing public buildings, and the public in judging of them. That a great many men have the same views with myself, and infinitely surpass me in their researches, is very true ; but it is equally as true that the greater number have what appears to me a very erroneous idea of the subject.

Artists, by the very nature of their occupation, are accustomed to think more of the causes or things which produce the emotions of taste than of the nature of the emotions themselves. From this habit they are apt to imagine that there is, in the constitution of man, some *one* sense, with its organ, by which beauty is perceived and felt ; this brings along with it the idea that certain forms of matter are intrinsically and inherently beautiful in themselves. On the contrary, men of retired habits and philosophic minds resist the idea of any such particular sense ; they suppose the foundation of the emotion of taste to reside in some general law of our constitution. Such were the theories, a thousand years ago, of St. Austin, who attributes these emotions to our perceptions of order or design ; and of Mr. Hume, who attributes them to our sense of utility. These were the kinds of theories which prevailed until Mr. Alison, in the year 1790, published his *Essays on Taste*, in which quite a new theory is submitted.

The foundation on which the former systems were raised was the supposition that the emotion of beauty was a simple emotion : Mr. Alison supposes it to be a complex one. And after a very minute and careful examination, most plentifully illustrated, he comes to the conclusion that, " whenever the emotions of beauty or sublimity are felt, that exercise of imagination is produced which consists in the prosecution of a train of thoughts ;" and that the difference between such trains and our ordinary trains of thought " consists, 1st. In the ideas which compose them being, in all cases, ideas of emotion ; and 2nd. To their possessing an uniform principle of connexion through the whole of the train." So that the pleasure arising from the emotions of taste results from the conjunction of the pleasure of simple emotion with that which, by the constitution of our nature, we feel when our imagination is exercised ; with this proviso, that such exercise is employed in the prosecution of a "*regular train of ideas of emotion.*"

Although I think Mr. Alison has, in his *Essays*, proved his theory to be correct, he has failed in applying it to the examples he illustrates in several instances. His division of the kinds of lines which bound objects, and in which their *expression* is supposed to

exist, is certainly incorrect. He divides them into even, uneven, angular, and waving or winding; and each of these kinds he subdivides into fine and strong. Fine and strong have nothing at all to do with the question, although he makes it a great consideration; for the outline of an object is, to all intents and purposes, a mathematical line, "length without breadth." He supposes fine and waving lines the most beautiful, because they are expressive of delicacy and ease. It is just possible the cause arises from the mechanical action of the muscles of the eye.*

As beauty lies not in any inherent quality of the object itself, but in the power of its combined expressions to excite the imagination to the prosecution of a regular train of ideas, the first thing to be considered, in investigating the causes of the beauty of a building, must be the nature of these expressions.

The *expressions* of which a work of Architecture is susceptible, may be divided into—*First, The physical or natural expression of the material.* Although no great source of beauty in itself, this expression is certainly a concomitant, and one which cannot be overlooked: for instance, a building of stone has a much greater expression of strength and durability than one of cement; and one of cement has a more cheerful and finished expression than one of brick. With the progress of science and philosophy the mode of construction and our ideas of durability will be gradually changed in proportion to our advance in the knowledge of the nature of materials; therefore this expression is not a lasting one. Thus, in

* "*Reasons why Arcs of Ellipses or Circles are pleasing to the Eye.*—Professor Müller, of Berlin, has, in a late course of lectures, offered a simple and mechanical explanation of the universal admiration bestowed on these curves. 'The eye,' he observes, 'is moved in its socket by six muscles, of which four are respectively employed to raise, depress, and turn to the right and to the left, the other two having an action contrary to one another, and roll the eye on its axis, or from the outside downwards and the inside upwards. On an object being presented to the eye for inspection, the first act is circumvision, or going round the boundary lines so as to bring consecutively every individual portion of the circumference upon the most delicate and sensitive portion of the retina. Now, if figures bounded by straight lines be presented for inspection, it is obvious that but two of three muscles are required; and it is equally evident that in curves of a circle or ellipse all must alternately be brought into action. The effect, then, is that, if only two be employed, as in rectilinear figures, these two have an undue share of labour. And by repeating the experiment frequently, as we do in childhood, the notion of tedium is instilled, and we form gradually a distaste for straight lines, and are led to prefer those curves which supply a more general and equitable share of work to the muscles.'"—*Mechanic's Magazine*, Feb. 4, 1837.

the present day, we know that a building of hard bricks covered with cement is stronger and more durable than one of our modern stone buildings, because the bricks, forming one homogeneous mass, will sink or settle equally, but, in the stone erection, more mortar being used on the inside than on the outside of the walls, the inside will sink the most. When this fact becomes generally known and acted upon, a cement building will be more expressive of strength than a stone one.

Secondly, The expression of fitness as regards construction. Of this we will speak presently.

Thirdly, The expression of design. Of this there are two kinds: the first, and least lasting, may be simply but correctly defined as *novelty of form*. The second kind is a sort of improvement on Nature, and is the setting a marked difference between the work of genius and art and a mere imitation. A good imitation of Nature is always *curious*, but, to sensitive persons, frequently painful. No one thinks of comparing the beauty of a statue of stone or marble with that of a wax figure. In statues especially the artist has the power of preserving the unity of expression in every limb, feature, and muscle, which in Nature is seldom the case. Flowers and foliage should always have an artificial arrangement, and should look (as Mr. Loudon expresses it) “sculpturesque” to partake of this expression.

Fourthly, The expression of fitness in the parts to attain the end in view, or to produce the expression of character.

Fifthly, The expression of character, without which there can be no permanent beauty. It is an expression very difficult to explain, and one that applies to an edifice considered as a whole. The buildings of the ancients and the middle ages have this expression in a very great degree; but I imagine much of it arises from the fact of each age having had its own peculiar style of Architecture; so that in addition to the character they originally expressed, all our associations connected with the characters of their respective ages are vividly recalled. This expression and the preceding one are intimately connected. Beauty exists in proportion to the *unity* of the expression of character in all the parts.

Sixthly, The accidental expression, which may last for years or but for an hour—may be caused even by the particular state of the atmosphere or our particular state of mind at the time a place is viewed. This expression is the cause of much difference of opinion: some particular feature of a building may accidentally recall peculiar associations of pleasure or pain, and cause a person to like

or dislike the structure ; whilst another in company, having different associations, would quite differ in opinion. It is impossible for the utmost art to invest a building with this expression, and quite as impossible to guard against its ill effects.

It is too commonly the case that Architecture is considered merely as an art of detail or of parts. If it is viewed in its proper light—that is as the *poetry of building*—the end of the art will at once be perceived. Style or order has nothing to do with it, further than as a means of preserving a unity of expression which is indispensable ; but styles or orders do not preserve this unity of themselves. The *reason* and *imagination* of the artist has as much labour to perform *now* as if there existed none. I have observed buildings in which some example of the ancients has been executed with very great exactness, perfectly devoid of character.

Perhaps the term most used with regard to architectural compositions is proportion. It is often used in a wrong sense, as if there were some particular proportions abstractedly beautiful. Proportions I conceive to be of two kinds: first, where each particular part seems to do its service towards supporting the fabric, and to be essential to that end: such is the meaning of the second expression, viz., fitness, with regard to construction. The second proportion is when the spaces or masses are so equally and justly balanced that no part or member intrudes itself on the view, but all the members are seen without tiring the sight. In such a case the eye takes in the large spaces first, and then the smaller, until all are perceived, without the mind or the eye being cloyed or fatigued.

The principal examples of Grecian Doric seem to have attained the perfection of both kinds of proportion ; and as these qualifications are productive of a very quiescent pleasure without much exciting the imagination, they render this order very appropriate for churches and chapels. Keeping the primary expressions always in view, proportion may be called the distinctive marks of beauty. A building, to be beautiful, should not be of a vast size, rather sparing of ornament, which should be quite devoid of intricacy, with the contrasts not too marked or glaring. In fact the chief causes of beauty are proportion with just as much variety as will prevent tameness and monotony without injuring the unity of expression or the regularity. I will just observe that it has been customary to ascribe beauty to uniformity and variety, which is, what it appears to be, a contradiction. Regularity and variety is the more correct term.

When we see three or four men employed in hoisting up and set-

ting one moderate-sized or comparatively small stone, the *means* appear so very inadequate to the end of raising a large building that we seldom or ever think of *how* many large buildings (such, for instance, as our old cathedrals) were erected. We look at them with a sort of religious feeling, as if they were indigenous to the soil. Any thing large or massive is so connected with our ideas of superior power that it is impossible to throw together a large quantity of materials without a certain stateliness or grandeur of appearance. So it is that many large buildings which, from their size, look grand, are very popular, and are said to be sublime, although in reality they are but indifferent designs. Witness St. Peter's at Rome, of which Prince Puckler Muskau says, "The vast multitude of pillars, vaultings, chapels, niches, altars, and monuments—all, for the most part, overloaded with innumerable badly designed and badly executed ornaments, consisting of arabesques, zig-zag flourishes, symbols, and coats of arms, or of bas-reliefs, doves, angels, and popes, together with saints and patriarchs of all dimensions—all this constitutes such a cut up and confused *ensemble* that it is impossible it should impress the beholder with that feeling of unity and grandeur as does the first view of the Pantheon in a manner perfectly irresistible!" The lavish profusion of ornament and the modern appearance the church derives from it, combined with its prodigious size, frequently lead those who are astonished by it to exclaim in a tone of enthusiasm that it is as sublime as it is elegant! Yet if we ask ourselves what is meant by elegant sublimity or sublime elegance, we are tempted to regard such a compliment as nothing else than a sarcastic epigram." Large buildings, although they may be grand from their size, can only be made sublime by the genius of the artist.

Perhaps a degree of uniformity is as necessary in large buildings as (after the original expressions) any other quality. By extraordinary richness and intricacy of detail, a bewildering magnificence may be raised: yet it will not satisfy the man of taste, and will soon fatigue even the vulgar. But uniformity excites the imagination by producing almost the idea of *infinity*; it does not tire the sight, it assists the mind in comprehending the whole, and displays the various beauties and remarkable phenomena of perspective to the greatest advantage.

It is a common thing with architects to pronounce a building good or bad merely from the correctness or incorrectness of mouldings, ornaments, &c., without considering the more noble and important ends of design. It is this practice, together with certain

other mystifying expedients, which has made the name of *architect* almost synonymous with *charlatan*.

In a well-designed building the original expressions, or rather the expression of character, will be the most apparent. And on a first view no part ought to be so conspicuous as to attract the notice of the observer before he has had time to comprehend the whole ; after which the proportions ought to be such that he can transfer his attention from the greater to the less in a regular gradation, without any difficulty.

With regard to the different kinds or styles of Architecture, I imagine the genius or rationale of them is not sufficiently studied. The Grecian is too severe to be used with much propriety in the present age ; in fact, a very great degree of its beauty lies in the effect of light and shade, to which our smoky towns and humid climate are not very advantageous. Besides, the simplicity of form which is so essential a character of it is not suited to our convenience. The ancient Roman or modern Italian are much more suitable to us ; they are susceptible of any shape and degree of richness, and have several bold features which other styles have not. But Gothic Architecture is the wide field for improvement ; its capabilities of form or character have no bounds. The chief fault of modern Gothic lies in its meagreness ; and in costly buildings, the not preserving a regular gradation of enrichment, from the bold projecting base to the pierced battlement and crocketed pinnacles. In plain or cheap buildings massiveness ought to be the character, and they ought to look as if considerations of strength and durability, and not poverty, had caused ornament to be overlooked. It is especially adapted to very large buildings, such, for instance, as the Houses of Parliament. In such a case it would, perhaps, be better not to have too much regularity, but to have the appearance of a pile of *buildings*, rather than *one large building*.

Nothing would tend more towards the advancement of Architecture than for architects to bear in mind the following opinion of Mr. Addison :—" Music, Architecture, and Painting, as well as Poetry and Oratory, are to deduce their laws and rules from the general sense and taste of mankind, and not from the principles of those arts themselves ; in other words, that the taste is not to conform to the art, but the art to the taste."

THE BIRMINGHAM MUSICAL FESTIVAL.

PREVIOUS to entering on the consideration of the last Birmingham Festival, it is the intention of the writers of the following remarks to lay before the readers of *The Analyst* certain general reflections concerning the legitimate purpose and scope of such meetings. To this course we have been irresistibly impelled by the conviction that principles of no mean importance to the welfare of mankind are involved in the question, Whether musical festivals are deserving of encouragement from the reflecting and the conscientious? or whether they are an evil against which it is the duty of the pious and the virtuous to make a vigorous stand? The task which we have undertaken is rendered the more necessary from the circumstance that while the opponents of musical festivals have boldly and in tangible terms urged serious accusations, their assertions have hitherto rather been evaded than fairly met, rather set aside than satisfactorily refuted. Whilst we admit that, in the present state of the controversy, the objectors have the best of the argument, it nevertheless appears to us that the notions of both parties are erroneous, or at best shallow and one-sided. When, on the one hand, we hear these meetings extolled for the assistance which they render to charitable institutions, and on the other inveighed against, in no measured terms, as fostering impiety, as introducing the profane thing into the "holy of holies," and as gratifying the flesh at the expense of the immortal spirit, we conceive that both praise and blame are attributed where they are least of all due, from the confused notions of right and wrong possessed by both parties, and from the substitution of those notions for the broad and immutable principles which reason, properly employed, is capable of deducing from the word and works of the Creator. Thus will men ever pursue an erratic and devious course, so long as they allow themselves to be tossed by conflicting opinions, without the compass of reason to warn them off the shoals and sand-banks on which their feelings, passions, and prejudices, are but too apt to strand them. How long will they keep their eyes rivetted on the surface, neglecting the things which lie hid from immediate view, ignorant that precisely these are the most worthy of examination? How long will they prize the letter above the spirit, the expression above the thought which it clothes? When will their eyes be opened to the fact that the errors, the vice, and the misery, caused by ignorance, exceed a hundred fold the sufferings produced by wilful mis

deeds ? Let the grand principle be once acknowledged, that every disputed point can only be properly decided when the reasoning faculties, holding the observing powers and the feelings in due subordination, use them as their servants ; that outbreaks of feeling, however genuine, will, if allowed the supremacy, only, like the lightning's flash, render more palpable the darkness which conceals from us the face of truth. Let this be once acknowledged, and we may rest assured that the sun will presently rise to guide us in our search, and reveal to our view features glorious in their grandeur and their simplicity, to behold which is our best reward after our greatest difficulties, our greatest trials.

It is stated that the main end of a musical festival is charity ; its object to relieve the distresses, and alleviate the unavoidable misery of our indigent fellow-creatures. Supposing the end to be good, does this sanctify the means ? Decidedly not : yet this is the principal plea on which the supporters of these performances have rested their defence. Let us examine somewhat minutely into the nature of the good work to forward which we are invited to join heart and hand. Let us recollect that although we may intend to do good, yet if the means we employ are productive of evil, intentions will not exculpate us. If to will the good of others be a duty incumbent upon all men, it is clearly no less obligatory to discover and put in practice the best means for accomplishing the desired end. If, through mental indolence or self-esteem, we refuse to apply our reason to so noble a purpose, the evil which we occasion will lie as clearly at our doors as if we refused to stretch out an arm to save a drowning fellow-creature.

It may, perhaps, tend to set the present question in a more striking light if we put a hypothetical case. Suppose a *nation* were to institute a festival for the purpose of attracting foreigners to subscribe funds for the maintenance of the poor, the aged, and the sick : in what terms would an enlightened stranger describe so extraordinary a custom ? He would conclude, and justly, that there must be something fundamentally wrong in the policy and institutions of that state, and that such make-shifts must lead to a ten-fold aggravation of the evil. The absurdity of one nation appealing to another is, indeed, palpable to the meanest understanding. Supposing England to contribute £10,000. towards the maintenance of the French poor, France would, for the moment, have the means of procuring in greater abundance the necessaries of life ; and this circumstance might, to a short-sighted French patriot, appear cause for congratulation. The Frenchman would, in some measure, be excusable if,

while exulting over the temporary accession of wealth to his own country, he was indifferent to the corresponding impoverishment of his insular benefactor. But no one can pretend that in any given country (England, for example) the slightest good is effected by depriving one set of men of their daily bread, in order to support another in idleness. As the distress in this country is caused by the supply being insufficient for the population, it is evident that no alteration in the *distribution* either of bread or of the means of procuring it can have the slightest effect in removing the evil, and that the only remedy lies in increasing the aggregate capital by so expending it as to produce an adequate return; the effect of which would be to raise the value of labour in proportion to that of the necessities of life, thus putting it in the power of every industrious man not merely to enjoy comforts to which he is at present a stranger, but to lay by a fund for the season of scarcity or sickness. It lies not within our province to indicate the means by which every human being may be placed above the humiliating necessity of depending for subsistence on the exertions of his fellow creatures; suffice it that we record our conviction that to apply the intellectual powers to the discovery and comprehension of the laws which regulate the inmost recesses of the social fabric, and by fearlessly applying them when discovered; to use our utmost exertions in forwarding that glorious consummation, "the greatest happiness of the greatest number," is the only true charity, the best fulfilment of the Christian precept, "Do unto all men as ye would that men should do unto you."

We next proceed to examine whether the festivals themselves are amenable to the serious charge of being an idle and sensual pleasure affording no profit to the soul, but rather tending to foster impiety and irreverence for the Deity; or whether, on the contrary, they do not rather afford delight and cultivation to some of the highest faculties of the human mind. It is on this ground that, in the estimation of all thinking men, they must stand or fall. If we can prove that performances of sacred music on a grand scale are a legitimate source of pure, extended, and ennobling pleasure, the conclusion will be inevitable that they cannot be too widely diffused nor rendered too easy of access, and that to the furtherance of this object ought the receipts to be exclusively dedicated.

The readers of *The Analyst* are, in all probability, generally acquainted with the language of Phrenology; we shall, therefore, in future, make no scruple of employing it in illustration of our ideas

on Music. That it is a duty to cultivate every faculty, that each is in its own nature good, only becoming hurtful when allowed unduly to preponderate, that the exercise of each is a source of pleasure, are axioms of phrenologists which few, we hope, will controvert. Although, however, all the faculties are good, and, if used aright, productive of happiness, they nevertheless differ widely in the rank which they hold in the mental scale. By the wise and benevolent arrangement of the Creator, the exercise of the higher faculties affords a greater degree of pleasure than that of the lower. Hence the pursuit, art, or science which employs the greatest number of the highest faculties is calculated to impart the greatest portion of happiness. Let us apply this test to Music. The two primitive faculties essential to the cultivation of this art are *Time* and *Tune*, the latter giving the perception of the relations of sound with regard to pitch, the former with regard to duration and rhythm. These we maintain to be common to the whole human race, and the assertion is strongly corroborated by the existence of a taste for music of some kind among the most savage, as well as among the most civilized, nations. Now, as God has endowed all men with the faculties which render music pleasing, and as he has, moreover, presented them with the most perfect mechanical means of gratifying those faculties—namely, the human voice—it seems self-evident that this beautiful adaptation between the desire and the power of satisfying it was intended to lead to a certain result, and that result was the art of Music. It seems equally evident, that he who cultivates these faculties fulfils a part of the intentions of his Creator, while he who neglects them is like the slothful servant who buried his talent under ground.

It may, perhaps, be objected by those who have no faith in Phrenology, that music is an artificial and factitious taste—a morbid and unnatural excitement—an art of man's devising only. For the benefit of such cavillers, laying aside for awhile phrenological language, let us state a few elementary facts, which satisfactorily prove that however music may have been improved by the art of man, it has its origin in Nature; and which, by shewing that Music, equally with Painting, Sculpture, and Poetry, is derived from the immutable laws of Nature, and the constitution of the human mind, place it on the same basis as one of the fine arts. Sound is the effect of the vibrations of matter upon the atmosphere. When these vibrations succeed each other at regular intervals a *tone* or musical sound is the result; when at irregular intervals, a noise.

Every tone gives rise to an indefinite number of others, produced by the aliquot* parts of the sonorous body. The principal sound is termed the *fundamental note*, those caused by it, being much softer, *harmonies*. Since, then, a fundamental note with its harmonies form a common chord, there is, properly speaking, no such thing in Nature as a simple sound. Now with every sane human being the power of distinguishing, and deriving pleasure from, sounds thus produced, is equally innate with that of calculating numbers and discriminating differences of form. On this ground we are no way afraid of contradiction from those whom experience has qualified to decide.

The art of Music, then, having Nature and the constitution of the human mind for its foundation, has been gradually brought to its present state of complication by following out the principles which regulate sounds, and by taking advantage of the properties possessed by their combinations to excite the imagination and the feelings. The arithmetician investigates the properties of numbers, the geometer those of lines, and the chemist explores the qualities of matter; and although each effects combinations not to be met with in Nature, their pursuits have never been stigmatised as unnatural. To bring the analogy yet closer to our subject—the painter, in combining forms and colours, light and shade, employs materials furnished by Nature, yet scruples not to apply them in a manner far from identical with hers: they are but the instruments, with which, working out the imaginings of his own mind, he produces a work of art. Even so it is with the composer. He is the poet, not of words, forms, or colours, but of sound. If *his* art is to be condemned as unnatural, on the same principle ought every other art and every science which effects new combinations to be blotted out from the book of human attainments. Leaving the defence of other branches of knowledge in the hands of those who are both able and willing to ward off the feeble attacks of the lovers of darkness, be it our task to explain the grounds on which Music rests its claim to rank as one of the noblest arts vouchsafed to man for his happiness.

The oscillations of a sonorous body cause vibrations in the atmosphere, which, in their turn, acting upon the external and internal mechanism of the ear, affect that portion of the brain whose function it is to judge of their pitch: each set of vibrations gives rise simultaneously to innumerable others, which, by the spontaneous action of Nature herself, afford the mind exquisite delight. When

* Parts related to each other in the ratio of 1, 2, 3, 4, &c.

we contemplate this chain of contrivances, so perfect in all its parts —when we consider that, by further study and more intimate acquaintance with the properties of sound, we have been enabled to vary and extend the simple accords of Nature,

“Untwisting all the chains that tie
The hidden soul of harmony”—

when we behold this admirable mechanism and its splendid results —what shall we say to the vain, short-sighted man who would fain persuade us, not only that so much skill has been lavished in vain, but that to employ the means which the Creator has placed within our reach is actually sinful?

The two faculties already enumerated may be said to constitute the foundation on which the splendid fabric of the musical art rests. We now proceed to the consideration of those loftier mental powers which contribute to the beauty and grandeur of its superstructure.

Ideality is the soul of art. Without its ethereal spirit Poetry degenerates into mere rhyme, Painting and Sculpture into a slavish imitation of Nature, and Music into a mechanical series of sounds incapable of affording the soul higher pleasure than the cowherd's horn or *Ranz des Vaches* to the flocks which browse on Alpine pastures. Ideality raises up before the mind's eye visions of beauty surpassing far the cold representations of corporeal sense; it wafts to the ravished soul harmonies inconceivably more pure and more lovely than mortal ear has ever heard. It is the fairy-land of the soul; enchanted ground, where realities have no place, and groveling ideas find no entrance; where the enfranchised spirit revels amid forms exquisitely beautiful, and mazes of sound which never weary, never cloy. Such feelings are the noblest proof that man is destined for a higher sphere of action than that in which he here moves; for it is inconsistent with the wisdom and benevolence of the Creator to suppose that he would have implanted in him aspirations so ardent after excellence unattainable here below, had he not been created with reference to a state in which those aspirations will be fully satisfied. And thus we are enabled to comprehend that, although these feelings may exist and have full scope in the soul, they can never be adequately expressed or made palpable to the corporeal senses. While Ideality ever soars towards perfection, the material media through which its impressions must be conveyed, being necessarily imperfect, intercept its loftiest flights, and force the half-enfranchised fancy back to earth. The two antagonist principles, the

ideal and the material, thus maintain a continual struggle : and although neither can ever gain the victory, whether in minds the least or the most imaginative, yet by a compromise, a kind of tacit agreement that the one shall be carried no farther than is consistent with the essence of the other—that each shall waive a certain portion of its claims to supremacy—much that is excellent may be achieved, much which, if it reach not, may yet be supposed to give some idea of, perfection. In art, the more the principle of ideality or perfection is fostered and brought to bear upon real existences the better is the purpose attained for which all art exists. Science searches out realities and the mode of their application, art strives unceasingly after ideal perfection ; the observing and reasoning faculties may, therefore, be said to be the soul of the former, Ideality—the intuitive presentiment of an eternal and perfect state—that of the latter.

Constructiveness, the next faculty to be noticed, is common to all animals. Among the lower animals the Beaver, the Bee, and numerous species of birds, afford striking examples. With man in a savage state the erection of the log-hut is, perhaps, its first manifestation ; but with the increase of civilization it finds scope for more varied action than in erecting shelter against the elements. Manufactures, arts, sciences, are all indebted to this faculty for much which, without its aid, they could not accomplish. In Music it produces and takes delight in contrapuntal difficulties for their own sake, heedless of the good or bad effect produced by their elaboration. Of this false taste the sacred works of the fifteenth and part of the sixteenth centuries afford striking examples ; whose sole merit consists in the mathematical exactness with which they solve musical problems. When the true nature of art became better understood, difficulties of construction were no longer regarded as an end, but as a means ; and Constructiveness, when thus limited to its proper sphere, and co-operating with the other faculties, not only affords them material assistance, but may fairly be said to produce a pleasure of its own. Thus, in listening for the first time to the sublime chorus "Cum sancto Spiritu" in the *Hohe Messe* of Sebastian Bach, we receive intense gratification ; but on a second hearing, after having studied the vocal and instrumental score, our pleasure will be greatly augmented by the insight which we have obtained into the construction of the piece, although in both instances our ears have received the same impressions. It appears, then, that this faculty, acting in proper combination with the others, gives rise to a gratifi-

cation *sui generis*, and not, as is the case with them, to one arising from the stimulus afforded by *Tune*, as the fundamental faculty.

The four faculties already enumerated are so essential to Music that, by taking away any one, scarcely any thing remains worthy of being called a composition. We now come to others which, however they may elevate, refine, and delight, are rather to be viewed as producing differences of style than as contributing to the component parts of music.

At the head of these stands *Veneration*, whose function it is to produce respect and reverence towards any being, person, or thing, superior, or supposed to be superior, to ourselves. It has impelled men, in all ages and in all countries, to seek objects of worship, too often without subjecting to the scrutiny of reason their claims to adoration. In those benighted lands where the Creator was unknown it drove them to prostrate mind and body before some physical existence, whose qualities seemed to render it his most fitting representative. Even among the chosen people of God, such was the over-activity of this feeling that, not content with the peculiar privilege of direct communion with their Maker—not satisfied with rendering homage where alone it is due—they were ever relapsing into the idol worship of surrounding nations. The abuses of mis-directed veneration meet us at every step in perusing the records of ancient history; nor have modern times escaped the evils consequent upon excessive and misapplied devotion. As the Jews were dissatisfied with a pure theocracy, so were Roman Catholics with the simple religion of the New Testament. They, too, must have their images; the Virgin and the saints were invested with supernatural powers; bread and wine were deified; and the pope was gifted with infallibility! But, while we point out the mote in our brother's eye, let us beware how we remain unmindful of the beam in our own. Are we, in our age and country, free from the reproach of idolatry? Alas! though under a different aspect, it still prevails among us. We no longer bow the knee before a golden calf or carved image, but we prostrate the spirit before opinions, forms, and observances, in reverencing which we fondly imagine we are rendering to the Almighty acceptable service. The legitimate object of the faculty of Veneration is the adoration of the Supreme Being, and when directed into this pure channel it can scarcely be carried to excess.

Again, when we are told that musical festivals are displeasing to God, and that all who attend them are breaking his laws, while

every one staying away performs a laudable act of self-denial ; if, instead of examining by the test of our own reason whether the action reprobated may not only be innocent, but even praiseworthy, we take its sinfulness for granted ; if, instead of trying the question on its own merits, we seek for palliations, excuses, or benefits, which may, in some measure, counterbalance the supposed evil ; we then suffer human authority to usurp the power to which no man can justly lay claim—that of arbitrarily enforcing on others his own standard of right and wrong. Lest our readers should suppose that, in the instance of festivals no one could be found to follow so imbecile a course, we can assure them that we have perused more than one notice of the Birmingham meeting in which the writers, while professing to be friendly to music, regret that an object so pure as the charity should be forwarded by means partaking of sin ! Our opinion of charities we have already stated ; let us now show that the opponents of sacred music are, through their ignorance of human nature, actually opposing their own avowed object, the spread of true religion and piety.

For the benefit of such cavillers, we beg to state that a large proportion of the pleasure derived from sacred music is caused by the operation of *Veneration* and *Wonder* (the faculties which give the instinctive knowledge of the Deity and the desire to worship him) ; and if Ideality throw her glowing mantle over the mingling vibrations, what reason can be adduced why those to whom the talent is given should not impress upon tones the same attributes which awe, and at the same time delight, the soul in the Psalms and the Book of Job ? Who was ever absurd enough to maintain that the sublime poetry of the sacred volume withdraws the attention from the simple idea ? and that, in perusing the Bible, we are delighted, not with the truths it inculcates, but only with its figurative language and lofty imagery ? The example of the inspired writers should teach us that the surest means of diffusing religion and piety among the mass of mankind is to press each vagrant feeling into the service of the Creator, and thus fan the too often dormant spark into an enduring flame not to be quenched with this mortal existence, but destined to burn with ineffable splendour through the vista of eternity. How many who repair to the house of worship with spirits harassed by the troubles of the world or deadened by its cares, feel, through the soothing and elevating influence of sacred harmony, their souls attuned to prayer and praise ? And what if the “high embowed roof,” underneath which we assemble to partake of the intellectual banquet, belongs to a building unconsecrated by man ?

We are told that "God dwelleth not in temples made with hands," and that times and seasons are alike to him. On what ground, then, shall weak and erring man arrive at the conclusion that the intense and varied emotions which agitate the bosoms of assembled multitudes as the mighty wave of sound bursts over their awe-struck souls, are polluted in themselves and unpleasing to the Deity?

We have already mentioned *Tune*, *Time*, *Constructiveness*, and *Ideality* as essential to the production and enjoyment of music; we have dilated on *Veneration* and *Wonder* as giving rise to the highest walk of the art, to that which is alone worthy to be employed in the praise of the Creator, as forming the broad line which separates sacred from secular music; we may now add *Adhesiveness*, *Cautiousness*, *Combativeness*, and *Destructiveness* to the list of faculties which find exercise and gratification in music. On these we shall not now enlarge, since in sacred and secular music they are at best only of secondary importance.* We think, however, we have satisfactorily demonstrated either that the Creator has endowed matter with several superfluous properties, and man with numerous unnecessary faculties (a supposition too much at variance with reason and experience to be for a moment entertained); or that it is incumbent upon man to take advantage of those properties, and employ those faculties for his own improvement and happiness. And, to revert to the principle from which we started (that an art is worthy of cultivation in proportion to the faculties it employs), we have also proved that Music is entitled to rank among the noblest pursuits which can engage the refined and the intellectual. It only remains, then, to consider the means best calculated to diffuse musical knowledge among the people.

The late celebrated phrenologist, Dr. Macnish, was of opinion that England would never produce composers equal to those of other countries—never acquire that enthusiastic admiration for works of genius which distinguishes the inhabitants of Germany and Italy. We think that he, in common with many other phrenologists, underrates the influence of cultivation on the fine arts. Whatever natural talent for Music or for Painting an individual may possess, he can neither excel in those arts himself, nor duly appreciate the works of others, without long-continued study of their principles and familiarity with their practice. No one is born

* It is proper to mention, however, that *Cautiousness* is thought, by some phrenologists, to have part in producing the feeling of the sublime: with what justness we are not at present prepared to decide.

with a taste for Handel's choruses or Raphael's Cartoons: the properties which have led the world to admire them are not to be discerned without deep reflection and sedulous cultivation. Here, then, we at once perceive the advantages which Italy, Germany, and France enjoy over England. In Germany, especially, the people live, as it were, in an atmosphere of music. Every child being taught the notes at the same time with the alphabet, with a view to singing at sight, or playing so as to take part in a quartet, it may naturally be conceived that the expense and trouble of getting together an orchestra and chorus capable of performing a grand work is there comparatively trifling. Hence, what in England costs a gigantic effort to accomplish, is in Germany an every-day occurrence. Whilst, at our festivals, the performance of the Messiah affords a never-failing source of self-satisfaction and self-gratulation, every German town containing above 20,000 inhabitants has its *Sing Akademie*, which, without any foreign assistance, produces the master-pieces of Bach, Handel, Mozart, Spohr, &c. Thus, while our ideas of art are confined to a few hacknied compositions, our neighbours become familiar with its whole range. Until we attain to this familiarity, our judgment and our taste will continue as they at present are, narrow, prejudiced, and one-sided. With this view let music be rendered as cheap and as widely diffused as possible; let the prices of admission to musical festivals be lowered, and let them occur much more frequently. The present charge of from 15s. to £1. 1s. for a single performance is exorbitant, considering that 5s. would be amply sufficient to cover all reasonable expenses, besides leaving a surplus for future contingencies.

The benefits resulting from such an arrangement are more numerous than might at first sight appear. In the first place, the important admission would be gained that Music is worthy of cultivation for its own sake; that, being in itself pure and holy, it needs no apology, no palliating accessories, and no shuffling excuses in justification of the pleasure it affords. The reduction of the price would make it answer to hold the festival annually, and thus enable the directors to bring before the public a far wider range of excellence than is practicable or judicious in a triennial meeting. Those who object that the public would thus become "satiated with music," take for granted one of two untenable propositions; either that music is only attractive while new, or that, if intrinsically pleasing, it becomes less so on familiarity with and knowledge of its effects. With persons holding such opinions it were waste of time to argue. We recommend them to go forth into the world,

and "lighten their darkness" by observation, before they thus venture to expose their ignorance. Were the performances annual, it would not only be allowable, but proper, to admit the works of second and third-rate composers. Cherubini, Schneider, Ries, and Neukomm would then meet with a verdict far more proportioned to their merits than can be the case whilst they are occupying the time which ought to be devoted to Bach, Handel, Mozart, and Beethoven. Thirdly, It would enable those of moderate fortune to cultivate the sense of the sublime and the beautiful without incurring an expense inadequate to their means. Lastly, The community would become more conversant with the higher walks of music, would form far juster conclusions of what art really ought to be, would estimate the petty accomplishment which now passes for Music at its proper value. The wretched songs, waltzes, and variations, now the staple commodity of music-shops, would be discarded with disgrace, from a conviction that the pleasure they yield is derived from inferior faculties only. Men would look back on the fashionable favourites of the present day with the same contempt with which they now regard the toys and the recreations of their childhood. When the true meaning of a work of art begins to dawn on their minds, they will bestow their admiration on the genius of the composer, instead of gazing in stupid astonishment at the harlequinades of the performer.

In criticising the late Birmingham festival, the first point upon which we shall animadvert, is the disproportion between the vocal and instrumental talent and the music which they were assembled to perform. No expense was spared to render the band and chorus as complete as possible; the principal singers were among the first which the world can produce; in short, as far as regards the material arrangements, we have but little fault to find.* But where were the great works, the poetical creations, the *mind*, whose expression might worthily employ this great multitude? With the

* We cannot, however, allow the non-engagement of Braham to pass without a few words of comment. It has been rumoured that the terms demanded by this unrivalled master of sacred song were exorbitantly high. That the amount might be large we can easily conceive; but we are at the same time convinced that his services would have outweighed those of Grisi, Albertazzi, and Tamburini; and surely he would have been satisfied with a recompense more moderate than the united salaries of these three distinguished singers. In an oratorio, the latter are, from their training, comparatively inefficient; they contribute but little to the artist-like production of a great work: Braham, on the contrary, is unrivalled in bringing out the mind of the master.

exception of the *Messiah*, we seek in vain for the splendid manifestations of genius which have from time to time appeared above the musical horizon. For what purpose do we attend musical festivals? Surely not merely to listen to the symphonious accordance of numberless instruments: if so, why ridicule the taste of the Turk who thought the tuning the best part of the concert? Neither is it to lower our standard of excellence by listening to works of second and third rate merit, when we might be drinking in with our ravished ears the highest productions of genius. Is it not, rather, for the opportunity they afford of holding communion with minds superior to our own—minds so pure, so exalted, so imbued with the spirit of poetry, that, to use the expression of Sir J. Reynolds, “we feel a kind of self-congratulation in knowing that we are capable of the feelings which they are intended to excite?” But when we commence the descent—when we begin to allow common mortals to appear heroes in our estimation, we shall find ourselves, ere long, groveling in the regions of mediocrity, and regarding with astonishment the performance of pigmies. *Onwards and upwards* should be our motto; superlative, not comparative, excellence our desire. Such considerations would appear to have had no influence with the directors of the Birmingham festival: *their* aspirations seem to have been after novelty, not after excellence. With regard to the *Ascension*, it might have been supposed that the fate of *David* would have operated as a sufficient warning against ever again admitting an oratorio by Neukomm, even to those utterly incapable of forming a correct estimate of the work from their own judgment. In bringing forward the *Triumph of Faith*, had the occasion been less serious, one might have imagined that the directors had been desirous of playing off a joke upon both the performers and the audience.

Upon works such as these, detailed criticism is thrown away, for no one will read an analysis of what no one admires, and the beauties are too few, the defects too numerous to render the task either pleasing or profitable. Let us speak, then, of Mendelssohn's *St. Paul*, which, in the absence of a greater work, may be regarded as the principal feature of the festival. This oratorio has been likened by some critics to those of Handel; by others, equally without reason, to the sacred works of Sebastian Bach. With neither of these great men has Mendelssohn, so far as we can perceive, much similarity, either as regards the grandeur and originality of their conceptions, or the mode of carrying those conceptions out. The general characteristic of Handel's style is massive simple grandeur. Instead of employing a number of smaller impressions to produce one

great homogeneous whole, he takes the hearer, as it were, by storm. His pre-eminence consists rather in his entire and *instantaneous* command over the feelings and emotions, than in the power of keeping them enchained at will during any considerable period. In his choruses he seldom adheres long to any particular idea, but makes each derive a great part of its effect from contrast with the preceding. In this contrast—in this intuitive knowledge of what and where to contrast—lies one principal cause of the immense hold which these compositions have maintained, and ever will maintain, on the public mind. It is disagreeable to the greater part of mankind long to follow out one idea, and to develop all its capabilities; any new idea, therefore, which prevents the necessity of doing this, is hailed with greater delight than if presented simply on its own intrinsic merits. And, undoubtedly, the composition where each idea is good in itself—where each is so placed as to stand in striking contrast with, and to afford agreeable relief to, the succeeding—and where their combination fulfils our conceptions of musical symmetry, is a high achievement of art. But it is to the master-works of Sebastian Bach that we must turn, would we contemplate excellence far surpassing this both in kind and degree. Bach is, perhaps, the only composer who has never submitted to the smallest compromise with the public taste—to the slightest modification of his own exalted ideas to suit the fancy of the impatient and uninstructed multitude. To him, therefore, are we indebted for the only true foretaste of what art is destined to produce when its capacities and ends are better understood than, at the present day, they unfortunately are. For an account of some of his works and an analysis of his style, we may refer the reader to the last number of *The Analyst*. If the estimate there formed be just, and if Handel be the “giant” the world imagines him, then have the critics of Mendelssohn awarded him higher praise than they perhaps intended, in pronouncing him “imbued with the spirit of Sebastian Bach,” and in declaring that he is “often Handel himself.” No assertions can be more contrary to truth.

On the other hand, it would be extremely unfair to make a composer's first great work the test of his abilities, or of the excellence to which, by study and experience, he may hereafter attain. We know not which is the more injurious to the interests of art—to expect a young composer at once to reject all previous models, and burst forth to the world with innate originality, or to place his first necessarily imperfect efforts on a level with works which have passed triumphantly through the ordeal of time. Take three of

the greatest musical inventors—men who have explored paths previously unknown or untrodden—Bach, Haydn, and Mozart. Bach's early compositions for the clavichord were formed on the model of those of Couperin, a fashionable French composer of that day, whose works have long since perished, and whose name would probably have fallen into similar oblivion but for the accidental honour of having assisted in calling forth the latent energies of the mighty master. The first symphonias of Haydn are scarcely to be distinguished from the writings of Emanuel Bach, and Mozart's two first operas were mere essays in the prevailing Italian style of that period. We may, indeed, safely lay down the general rule, that before any man can worthily give utterance to original conceptions, he must first be able to do well what others have done before him. From such preliminary training the highest powers afford no exemption.

To form a perfectly just estimate of a cotemporary production professing to be a candidate for immortality, is, of all the labours of the critic, the most difficult properly to fulfil. Hard, indeed, and requiring no ordinary discernment, is the task of determining how far a work of art is indebted for present popularity to its conformity with existing tastes and prevailing modes of thinking, and how much to the forcible appeal which it makes to the eternal feelings and passions of the soul, in contradistinction to their temporary and accidental modifications. In criticising a recent work, we may avail ourselves of our acquaintance with the master-pieces of former times, and compare the means by which they attained to excellence with those employed in the present instance: it is evident, however, that this mode of judging must (from the nature of the fine arts, and more especially of Music) be extremely defective, and become liable, in the hands of the bigoted and pedantic, to act as a drag on further progress. Genius spurns the shackles of precedent; it pursues its course, heedless and independent of other men's ideas; it dwells not on the memory of the past, but penetrates into the mysteries of futurity, and is, therefore, beyond the comprehension of ordinary minds, ever prone to cling to the trivial forms and conventionalities of the petty sphere in which they move. In forming, then, an opinion of cotemporary works, we should eschew with equal care an over-reverence for the past and that narrow-mindedness which dwells only with complacency on the productions of the present; and should endeavour to hold the scales with impartial hands, attributing merit where merit is due.

All great composers—all who, in their ideas and their manner of

expressing them, advanced beyond the age in which they lived—have displayed their greatness in vocal as well as in instrumental writing. Many there are, doubtless, of respectable merit, who have confined themselves to the one or the other of these departments; such, however, it will be found, are not entitled to rank as inventors in the highest sense of the word. They are either polishers, or else mere followers. In the first class we would place Correlli among the instrumentalists, and among vocal writers Sacchini; in the second Geminiani and Tartini, together with the host of glee-writers and many of the compilers of anthems, whom English pride regards with affection more fond than judicious. If we try Mendelssohn by this test, we shall be compelled to refuse him that exalted rank to which his admirers would persuade us the oratorio in question entitles him. Throughout the whole of *St. Paul* we perceive with regret an almost total want of that vocal excellence, that luxuriance of melody, that “linked sweetness long drawn out,” which, in the works of the three great composers above-named, so forcibly arrests the attention and enchains the soul, and which, even in their instrumental writings, forms, perhaps, one of their greatest charms.

The overture to this oratorio is, perhaps, that part which is most complete as a whole, and most calculated to give satisfaction to those who desire unity of design and treatment in a musical composition. It opens with a very solemn and impressive slow movement on the subject of the *choral*, “Wachtet auf, ruft uns die Stimme,” in the body of the work. This is followed by a fugue in triple time, on a very elegant subject (taken from the same choral), treated in a manner much more masterly than those which are made the foundation of any of the subsequent choruses. Indeed, it is on this overture, as well as on his other instrumental works, that we principally rest our hopes of seeing an oratorio by this composer the *vocal* excellence of which shall far surpass that displayed in the present, and the want of which is, in our opinion, its great, its overpowering defect. Thus, in the song “Jerusalem, Jerusalem!” the interest lies entirely in the instrumentation and modulation, while the notes given to the voice form a mere apology for a melody without the slightest pretensions to *air*, or even to novelty. The same is the case with the bass solos “Vertilge sie” and “Gott sei mir gnädig;” in a remarkable degree, with the duet “So sind wir nun Botschaften” and “Dann also hat uns der Herrgeboten,” with the difference that the sterility of melody communicates itself, in these two instances, to the accompaniment, which is bald and commonplace.

The triviality and want of dignity in the subjects of the fugues is seldom compensated for by a full display of their capabilities, or even by an ordinary skilfulness of treatment; and the winding-up is effected, not by their complete development, but, on the contrary, by a return to the plain, note-against-note counterpoint, to which this composer seems so devotedly attached: witness the choruses "Mache dich auf, werde Licht," "O welch eine Tiefe des Reichthums," "Denn alle Heider," in which, even in what may by courtesy be termed the fugued parts, the composer often relapses into his darling plain counterpoint, and the concluding chorus "Nicht aber ihm allein," in which a pitifully mean subject is handled in a manner very different from what is expected from one "imbued with the spirit of Sebastian Bach." The chorals so plentifully interspersed throughout the oratorio are good, but not Mendelssohn's, as any one may satisfy himself by glancing over any collection of psalm-tunes used in the continental Lutheran church. We have hitherto only spoken of what we consider the defects of this work: its beauties are neither few nor difficult of discovery. The instrumental writing is, in general, as rich and characteristic as the vocal is meagre and commonplace, and displays considerable knowledge of orchestral effect, as well as boldness and freedom of fancy. We may mention as examples the choruses "Herr du bist der Gott," "Wir preisen selig," "Ich danke dir Herr," and "Wie lieblich sind die Boten." The recitatives are, in general, well-declained, and provided with appropriate and often bold harmonies. But hardly any degree of excellence in other points can atone for a general poverty—we had almost said absence—of *melody*, the necessary element of all harmony worthy of the name. Our opinion of this work, then, taken as a whole, is that its want of individuality, of the marks of true genius, inventive power, grandeur and elevation of thought, and more especially of original and flowing melody, will effectually debar it from enduring fame, perhaps even from temporary popularity; that, although displaying far higher genius than such works as *The Ascension* and *The Triumph of Faith*, it nevertheless falls short of that magnificent power which moves at will the passions and the feelings of men, and holds them willing captives in the regions of ideal beauty or superhuman sublimity; which is as mighty to-day, to delight and to awe, as it was ages ago, and as it will be for ages to come, so long as human passions and human feelings remain to bear witness to, and bow before, its sovereignty.

We consider the total neglect of Spohr a by no means venial er-

ror of the festival directors. Why should they not have produced the entire *Crucifixion*, in order to give the public an opportunity, for the first time, fairly to judge of and appreciate its undeniably great beauties? The production of such a work would have redounded equally to the credit of the festival and to the gratification of the public.

But of the treatment of Sebastian Bach, we can scarcely think or speak with any degree of patience. It was alluded to in the last number of *The Analyst* in terms of strong animadversion, but we never expected to witness anything half so injudicious as the manner in which this great man was for the first time introduced to the public as an oratorio composer. When are we to see the end of these eternal selections—of this tearing out a leaf in order to give an idea of the scope and tendency of a book—which, when applied to a great work of art, which must be heard and studied *as a whole* in order to understand in all their grandeur the sublime conceptions of the master, are in the highest degree absurd? We do not disapprove of selections in every case, provided they are made with judgment and in a spirit congenial to that of the author. Indeed (considering the rarity of musical festivals), they are absolutely necessary, unless we would restrict ourselves to the works of one or two masters. But there are some works of which the most judicious selection can never give an adequate idea; and such, if they cannot be performed entire, should not be performed at all. Such a work is the *Passions-musik*, which we fear, even if done ample justice to in the performance, would not meet with a responsive echo in a Birmingham festival or in any English audience equally large and equally promiscuous. Every one can admire the simple and massive grandeur of Handel's "Hallelujah" chorus: to a few only is as yet revealed the true meaning of the glorious conceptions contained in Bach's gigantic and eternal harmonies. It behoves, then, those who cater for and, at the same time, by producing the works of a great composer, hitherto unknown, desire to improve, the public taste, to use great discretion in their choice. They must not rest satisfied with indolently confining their researches to the works of which common report speaks the most highly; they must not present a disjointed fragment (and in a minor key, too!) as a specimen of the whole, or of the composer's powers; nor must they be astonished, or impute it to the bad taste of the public, when their injudicious and abortive efforts utterly fail of attaining their end. This, however, *was* the course pursued at Birmingham: on those who follow it rest the blame and the disgrace. At the next festi-

val, as some atonement for their past misdeeds, we suggest the propriety of giving Bach a "fair trial." Let them produce the *Hohe Messe* (Grand Mas) in B. minor ENTIRE. If they can once bring up their courage to the "sticking pitch," if they can once throw aside slothfulness and foolish fears, they may, by so doing, earn for themselves the sincere and heartfelt gratitude of all real lovers of music. Or, if such an effort be too great for them, they may produce one of the numberless motetts and sacred cantatas of this composer; and thus, if unmindful of the glory of being the first to bring forward one of his *great works*, may at least escape the disgrace of again mutilating them.

It will not do here, to plead in excuse that the piece selected was only by way of experiment, that a longer work might have disgusted the public, and that, if successful, it would be time enough at the next festival to produce something more complete. The result of *such* an experiment every one not blinded by self-interest and prejudice must have foreseen. It was like trying an accused person with a predetermination to condemn him; bringing up all the witnesses against him, keeping back those on his side, and listening only to the counsel for the crown. In the present instance the subject of experiment, say rather of condemnation, was a piece in a *minor key*, severed from its connection with the rest of the master-work in which it stands, one of whose many transcendent merits consists in the intimate, though not at first discoverable, relation in which all its parts stand to one another, in the beautiful binding together of each piece, so as to form one perfect and indivisible whole. Those who, in thus mangling the works of genius, show that they have no higher notion of art than as a momentary gratification of sense, who would convert an oratorio into a selection of favourite airs and choruses, who can see no link of connexion between music separated by double bars, and who would bring others down to *their* bounded ideas of excellence, are unfit for their responsible office.

But a truce to fault-finding. Let us suppose the directors willing to attend to any suggestions which may have the effect of raising the character of the meeting whose interests they wish to advance. Suppose they put the question to us, What steps would *you* take to advance the art whose welfare you so warmly advocate? We answer, Seek out excellence where most it abounds; heed not whether a composer be celebrated or unknown, ancient or modern; suffer not yourselves to be dazzled by the false glare and ephemeral excitement which attends the production of a foreign work in presence of its author; satisfy yourselves, by diligent research, when

and where the high style, which it is your duty to bring before the public, prevailed; and having formed your conclusions fearlessly carry them out into practice.

The oratorio is the highest walk of the art. This epic branch seems to have arrived at perfection about the end of the seventeenth and the beginning of the eighteenth centuries. Previous to that era it was not sufficiently dramatic, and subsequent to it became too secular. In the masterpieces of that period we find the sublime, the beautiful, and the ornamental styles, each in due proportion; the sublime taking the precedence of its humbler rivals. We have here another proof that the feeling of the sublime is intrinsically the same with that of devotion. Religion was still the main moving spring of the age: no longer, indeed, the religion of cowed monks, chanting solemn requiems in the long-drawn aisle or lonely convent; no longer the religion of penitent hermits or pilgrims, seeking heaven in a renunciation of the world; no longer a religion of feelings and impressions; but one of thought, argument, and conviction, present with the statesman in his cabinet, accompanying the warrior into the battle-field, sending whole tribes into voluntary exile for conscience sake, and hurling princes from their thrones. Similar was the change which came over the spirit of music. The unearthly and purely sublime strains of Palestrina, Bird, Tye, and Tallis, gave way to the "Te Deum" exulting over the fallen foe, and to the oratorio embodying, in the form of a religious drama, the stern martial and political temper of the age.

In accordance with these views, we find that cotemporaneous composers in Germany, Italy, and England, produced works which bear the impress of colossal grandeur. Whatever might be the stamp of their individual genius, the influence of the school in which they studied, or the character of the people for whom they wrote, they never descended from that commanding elevation which has earned for them an enduring name.

Among the writers of this period, then, must we seek for the fittest offerings at the shrine of Veneration, Wonder, and Ideality. And truly that we know but the names of some of the greatest, and of those with whom we are more familiar, only such works as chance has thrown in our way, heedless whether those we neglect be not yet nobler, are facts which say but little for our love of art, of ideality, of proportion. Of Bach, towering far above all rivals, we have already spoken. But Handel, that name "familiar as a household word," what apology shall be indited for his treatment by "the general?" Has he written only *one* great work? "Where is

"Israel in Egypt?" where "Judas Maccabeus?" where "Deborah?" where "Sampson?" where "Solomon?" Slumbering in oblivion, buried under the neglect of ignorance and self-satisfaction. Leo, too, whom Handel himself pronounced the greatest composer of his day, and whose glorious pedal-points stand unrivalled for massive grandeur, must he give place to Neukomm and Häser? Let us hope that at some future period, distant though it be, we may be permitted to enjoy the tender accords of Hasse in his *Betulia Liberata*, and the pathos of Jomelli in his *Requiem* and *Passione*. On turning to the German school, the name of Graun rises up to reproach us for the neglect of his *Tod Jesu* (Messiah), which in Berlin enjoys a popularity equal to Handel's work on the same subject in England. The solo songs, if given by a performer capable of estimating the mind of the composer, would produce a splendid effect. This work abounds in admirable chorales; and we hesitate not to pronounce the fugue "Christus hat uns Vorbild gelassen" superior to any thing which Handel ever wrote in the same style. Greatly would it rejoice us to see this work well-adapted to English words, and to hear it worthily performed by a band like that employed at Birmingham. The *Te Deum* of the same author, composed at the command of Frederick the Great, is replete with grandeur and beauty. The movement "tu rex glorie" is remarkable for the bold and sublime employment of double discords; and the whole composition belongs to a class worthy of being produced at a great festival. With regard to Pergolesi, who excels all other masters, except, perhaps, Purcell, in pathetic expression, we should delight to hear his *Mass for Five Voices*, of which the "Gloria in excelsis" is so well known. We throw it out for the consideration of the directors, whether it might not be possible to give it with the Latin words. We are fully aware that this is delicate ground; but as the fragment already mentioned of this work has always been so performed at the Ancient Concerts under archiepiscopal sanction, we think the experiment might fairly be tried on a larger scale without wounding the conscience of orthodoxy. We are convinced that the mediocre success of many foreign oratorios which have been lately introduced into this country is attributable, in great measure, to the forced character which must ever attend even the most skillful adaptations. In the mass above-mentioned, we meet with a fugue (immediately preceding the popular "Gloria") to the words "Kyrie Eleison," and which, for stern solemnity, will scarce find a rival elsewhere. How much more conspicuously will the power and versatility of the composer stand forth, if an opportunity be al-

lowed of hearing these two masterly efforts in juxtaposition than by constantly repeating the last only, as if what preceded was unworthiness of notice: With regard to the words, we are at a loss to imagine in what manner "Kyrie eleison" or "Benedictus qui venit" can give offence to the tenderest consciences.

On the sacred works of Haydn and Mozart we may be expected to say a few words. The readers of *The Analyst* must be aware that we belong to the number of those who for the highest of all subjects require the highest style of art. To term music *sacred* which excites no veneration, is a palpable misnomer. In vain do the words invite to lofty contemplation if the music, in wanton dalliance and sportive fancy, twines, with spell more potent, round the soul its alluring blandishments. If such be its character, the greater the skill of the composer, the more effectually does he frustrate the object for which sacred music is ordained. If there be any truth in the theory we have already laid down and partially illustrated—namely, that music is a mirror which faithfully reflects the character of the age—in the (so called) sacred music of the latter half of the eighteenth century our ideas receive ample confirmation. The papal power, long since divested of its physical terrors, had with them lost its influence over the minds of the greater part of the Christian world. The eyes of those who had blindly confided in the infallibility of the church now began to be opened; intellect once more asserted her rights, reason submitted no longer to be trampled upon by force. But as men are ever prone to fall from one extreme into its opposite, so in the present instance: when the enormous abuses and egregious follies of priestcraft were laid bare, with powerful and unsparing hand, by the French philosophers, so replete with moral deformity, so supported by wilful deception, did the whole fabric appear, that religion herself was pronounced an imposture and cunning device of the learned, to acquire wealth and power by working on the fears of the credulous and the ignorant. The goddess of reason was proclaimed supreme—Alas! that fanaticism should assume that noble name! Aye, fanaticism; for no crusaders ever pursued with more unrelenting hate their infidel foes, than did these *reasonable* men strive to bury, in one common ruin, the noble principle of Veneration and the abuses which the crafty and the designing had wrought under its name. In times like these, when a scoffing demon was let loose upon the earth, when men either abjured all religion or else only professed an adherence to it from motives of self-interest or political expediency, it were idle to expect an art to give utterance to feelings of which the heart

was destitute. In proportion to the contempt into which religion had universally fallen, did the church music of Germany, Italy, and England, degenerate in all which distinguishes the sacred from the secular. Instead of sublimity we find prettiness, playfulness and effeminate sentimentalism, or, if anything higher is aimed at, that dulness which is ever the result of pretence taking the place of reality, as the constant characteristics of the productions of this period. As instances, take Vinci, Galuppi, and Guglielmi, in Italy; Naudman, Himmel, and Weigl, in Germany; Kent, Worgan, and Nares, in England. As choral writers, these are all pigmies compared to their predecessors. Haydn and Mozart, though possessing immeasurably greater powers, escaped not the influence of their age. The *Creation* will live for ever, but its charm lies rather in the freshness of its melodies, and the playful brilliancy of its instrumental accompaniments, than in the sublimity of its choruses; and even these would probably never have been written had not Haydn, during his visit to this country, become acquainted with the works of our church composers and of Handel. His *Seasons*, also composed subsequently to his sojourn here, is not an oratorio, but a dramatic-pastoral cantata, and, considered as such, is excellent.* His masses contain some beautiful quartetts and solos; but the choruses are on two petty a scale, and their whole character is secular, not sacred. As to the productions called Mozart's masses, we are convinced that they are either *not* his, or else that they are early and hasty effusions, giving no juster idea of his style and genius than does *Titus Andronicus* of Shakspeare's. We are the more inclined to this belief as, in the *Requiem*, we see no indistinct traces of the greatness to which this mighty master might have attained in the sacred style had he been spared time fully to realize his conceptions. We are surprised that the admirers of Mozart have not made more strenuous efforts to obtain the performance of this extraordinary production.

Of subsequent composers, with the exception of Spohr, we recollect only one grand work on a religious subject which deserves to live. When we reflect that that work is the production of an Englishman, we blush for the neglect which its author has suffered at the hands of his countrymen. We allude, of course, to the *Palestine* of Dr. Crotch. While numberless critics are engaged in the contemptible task of magnifying mole-hills into mountains, they seem by com-

* This charming production would, if given in the evening, afford a treat worthy of an intellectual audience.

mon consent to suffer the man who, without losing his individuality, is truly imbued with the spirit of ancient times, to live forgotten and unappreciated by his contemporaries. *Palestine* is immeasurably superior to most of the foreign novelties which have been so carefully fostered by ridiculously exaggerated commendations. No crude or hasty production, it owes none of its attractions to clap-trap accessories, the commonplace substitutes for genius. The sublimity of the choruses and the beauty of the sextetts, quartetts, and solos strike the mind as forcibly when played on the piano-forte as when rendered by countless voices and instruments, or warbled by the most finished vocalists. Let us not be told that the price demanded by the author is exorbitant. If the plodding labourer is worthy of his hire, if selfish intrigue too often attains its ends, shall genius always be expected to lavish its benefits on mankind and receive no return?

A word concerning the *evening* performances. If in the morning the riches of the ecclesiastical composers of former ages have (or *should* have) awed and elevated our souls; in the evening we expect to be enchanted with the varied beauty and grace of those who have chosen the opera, the symphony, and the instrumental solo as the channels in which to pour forth their ideas. We lose all patience when we reflect on the miserable jumble which selections—not only at Birmingham, but at almost every festival—present. Ignorance and bad taste here reign triumphant. What excuse can the directors, with unlimited national means at their command, bring forward for so deplorable a failure? Their justification may be comprised in three words—*they please their audience*. This lamentable fact it is vain attempting to deny: let us, then, boldly look the truth in the face. It appears that a selection in which a dull glee follows a trashy song, which, in its turn, gives way to variations on the concertina, attracts a larger audience than a succession of the loftiest master-works of Music's most favoured sons. A more lamentable instance of the lower faculties triumphing over the higher it is difficult to conceive. To us, however, far from presenting anything surprising, it only appears a necessary consequence of the present wretched state of musical instruction. As, to the clown, the sign-painting creaking before the alehouse in his native village seems a transcendent specimen of art, so, to the flimsily-educated young ladies and gentlemen honouring these concerts with their presence, do *The Light of other Days* and *Wandering Willie* fulfil their utmost ideas of excellence. So painfully low is their standard, so utterly devoid of ideality are they, that, provided Grisi be

the singer, it is to them immaterial whether the song be *Son' Ver-gin'* or *Non Piu di Fiori*. Of such, the endeavour to improve the taste is, we fear, useless. The best seed here falls into barren ground, or is blown away by the wind before it reaches it. Let us not, then, throw away our words in the idle attempt: let us rather address ourselves to those who really feel their deficiencies and desire to see the rising and future generations enjoying the benefits of which *they* know only the want.

From our thorough conviction of the high rank which Music holds among human attainments, from our knowledge that the power to obtain a certain degree of proficiency in the art is common to all men, we form the conclusion that it is at present far from effecting the good and diffusing the happiness of which it is capable. How few know what Music is! how many accept the dross for the ore! how many set a higher value on the manual dexterity of the performer than on the mind of the composer! Lamentable, indeed, is the thought that, for the majority, Bach, Mozart, and Beethoven, have hitherto lived in vain; that their brightest conceptions and noblest combinations speak no more pregnant meaning than a succession of chords without connection. It will not, cannot, always continue so; the many have slumbering within them the *power* to appreciate genius; but few only, under existing circumstances, are allowed the opportunity of cultivating the faculties they have received from their Creator. On this universal capacity we found our hopes. From that musical establishment, the profession, we expect little. Its members have their own ends to serve; and as far as their private interest coincides with that of the art by which they live, they will doubtless exert themselves for the improvement of the latter. Beyond this they will not go; nor is it to be looked for. But the gains of the few must not be suffered to oppose the happiness of the many; and we perceive cheering tokens that these are at length beginning to understand their own interest.*

We hope to see the time when the love for the sublime and the beautiful shall triumph over personal vanity and mercenary selfishness—when the meaner feelings which have so long clung to and disgraced the fair fabric of the arts shall no longer bring opprobri-

* We hope, through the medium of *The Analyst*, at some future time, to return to this important subject, and endeavour to point out *the means* by which the imperatively called for improvement in the public taste may be brought about.

um on Music—when it shall have been discovered that for the many *themselves* to waken the slumbering mind of the mighty master, is better than to pay hired labourers for rendering that which when rendered is not understood. We feel that our words will not be wasted; we write with certainty that we shall touch a responsive chord in the bosoms of thousands who, spurning petty vanity and sordid selfishness, actuated solely by a love for art, are applying their energies to its diffusion, and by their exertions affording the best proof that we advocate no idle fancies, no Utopian dreams. The Sacred Harmonic Society, from an humble beginning, has risen to an eminence which the most sanguine among its founders can scarcely have anticipated. The performance of *Israel in Egypt*, Handel's most stupendous work, filled us with hopes for the cause of Music in England. In the *vocal* department they undoubtedly surpassed the paid chorus singers whom, three years before, we had heard perform the same work at Birmingham. How striking, too, was the contrast between that evening's achievement and the threadbare selections and meagre execution of the once-famed Ancient Concerts. Triumphs glorious as these will ever be the result when the many unite their sympathies and their powers. Neither money, nor rank, nor the narrow spirit of exclusiveness can prevail against cordial co-operation. The Sacred Harmonic Society stands on the secure basis of *principles* stable as the laws of Nature and of mind. We beg its members to accept this tribute, in return for the pleasure they afforded us. They are on the right road. May their prosperity be in proportion to their deserts!

Cheering, indeed, is the prospect that the period is approaching when *all* shall labour in the vast field of art with a view to their own intellectual and moral improvement, where *now* a few coldly and inadequately toil to obtain a scanty pittance. The powers of mind and of voice requisite to give an air with effect, may ever, perhaps, remain confined to a few; but the interest derived from even the finest of such exhibitions shrinks into insignificance, compared with that inspired by the choral union of countless voices rolling through the mazes of endless fugue. And when mankind shall have become acquainted with its higher walks—with the deep truths of which it is a "fit embodiment"—how different will be the emotions suggested by the word *Music*, from those raised by the compound of frivolity and pedantry with which it is now synonymous. When a longing for, and admiration of, the noble and the grand shall have replaced that eager and restless desire for trifles which disgraces our age, then will the now hidden treasures of for-

mer times be fully explored and appropriated : Bach, Handel, and their cotemporaries will supersede on every piano-forte the wretched collections of harmonized aids, miscalled Psalm-tunes ; and Sunday evening, instead of being the last refuge of dullness, will resound with strains worthy of the object they commemorate, and which will assist in raising the soul to a contemplation of that pure and happy state where beauty transcending far the poet's dream, and harmony more exquisite than minstrel ever wrought, shall reward us for temptations resisted and difficulties overcome.

Y. D. AND T. W.

ABSTRACT OF A PAPER ON THE FOSSIL ICHTHYOSAURUS

LATELY PURCHASED FOR THE BIRMINGHAM PHILOSOPHICAL INSTITUTION,

READ ON THE 1ST OF MAY, 1837.

THE Lias, from which the interesting specimen we are going to describe was taken, is one of the members of the secondary strata intermediate to the oolites and new red sandstone, upon which it lies unconformably, to use a geological phrase—that is, it does not follow, in the planes of its stratification, the elevations and depressions of the upper surface of the sandstone, but fills up the latter, and rests upon the former, in a way that proves that the deposition of the Lias took place long after that of the sandstone. It extends in a broad curve laid across the kingdom diagonally from Lyme in Dorsetshire, through the counties of Somerset, Gloucester, Worcester, Warwick, Leicester, Nottingham, and York, to Whitby. It consists of nearly horizontal beds of white, blue, or blackish limestone, occasionally hardening into marble, and of various thickness, alternating with layers of stiff argillaceous shale or blue clay. Sometimes the beds of limestone contain nodules of the same substance imbedded in clay, that separates them from the surrounding stone ; and it was in one of these nodules that the present specimen was enclosed, in a manner to which we shall have occasion to revert hereafter. The stone contains from sixty to ninety per cent.

of lime, the residue being alumina and oxide of iron, which give the mortar prepared with this lime the important property of hardening under water. It is a marine formation; and, besides the bones of Ichthyosauri and of other saurian animals, it abounds in the remains of fishes, crustaceous animals, and mollusca, particularly of gryphææ and ammonites; and fragments of carbonized and pyritous wood are frequently found, both in the stone and clay. Parts of the strata constituting the Lias are much impregnated with bitumen, so as to have led to their being worked for coal; and where this occurs in conjunction with pyrites, as at Whitby, vast quantities of alum are procured from the decomposition, by spontaneous or artificial combustion, of these substances. From the great regularity and evenness of the beds of stone and clay, whose inclination is not more than forty feet in a mile towards the south-east, as well as from their nonconformity with the new red sandstone, it is evident that this was in a quiescent state at the time that the Lias was deposited over it; and the general absence of fragments of rocks or stones in the Lias strata would lead us to the conclusion that this formation also was the result of causes acting, not with violence, but continuously, did not certain circumstances connected with the distribution and state of preservation of the organic remains, tend to induce a belief that catastrophes, of sufficient force not only to cause the death of the inhabitants of the deep, but also to produce their speedy interment in the mud and ooze at the bottom, were not of unfrequent occurrence at this period.

The Lias at Barrow-upon-Soar, in Leicestershire, where the present specimen was found, presents a remarkable regularity and correspondence in the thickness of the layers of limestone and clay, the former being usually ten inches, the latter eighteen inches, thick. The dip is but slight, amounting only to an inch in a yard to the east, although Mount Sorrel, a sienitic rock and the first of a range of primary rocks extending over the forest of Charnwood, is in the immediate vicinity, being only separated by the little stream of the Soar and the meadows through which it flows, from the out-crop of the Lias on the opposite bank.

The nodule that contains the Ichthyosaurus, however, did not lie in one of these beds of stone, but in a stratum of reddish clay above them. When entire, it was nearly six feet long and two feet wide, and about seven inches thick, having the general form of a fish deprived of its tail. It was broken into several portions by removing it from the quarry, and the parts containing the end of the nose and part of the tail were lost. It is formed of a series of concentric

layers of limestone, increasing in hardness and crystallization, from hardened clay on the surface to perfect marble at the centre. When brought to Birmingham, a stone-mason was employed to chip off the stone from one side, so as to bring the enclosed skeleton into view ; and then it was discovered that portions of the paddles, and the extremities of some of the ribs were wanting, in consequence of their passing quite through the stone. Mutilated, however, as it is, it is one of the most perfect specimens of the *Ichthyosaurus* as yet discovered, and is a very valuable addition to the collection of the Institution.

As now displayed, the animal is lying on its right side, with the paddles extended laterally, and the head, dislocated from the neck, resting on its upper part. But the description of the injuries it has sustained is better reserved for the place where we shall attempt to explain their cause ; at present our object is to describe the peculiarities of the structure of this class of animals by their analogies among still existing races. In external form the *Ichthyosaurus* partook of the appearance of the Crocodile and Lizard tribes and of the Whale ; of the former in the shape of the head, body, and tail, and of the latter in the form of its anterior paddles, that closely resemble the fins of the Whale, and in the want of scales or any external bony defence. But in imposing the name *Ichthyosaurus*, or Fish-Lizard, Mr. Kœnig seems to have fixed his attention upon the form of the vertebræ, which closely resemble those of the fishes. In size the *Ichthyosaurus* far exceeded the recent Crocodiles, being sometimes thirty or forty feet in length, of which the head forms a very variable proportion, from the difference in the length of the jaws in different species.

Dr. Buckland, in his *Bridgewater Treatise*, has given a plate of the petrified skin of the animal ; but though we have not been able to discover any thing exactly similar in the present specimen, yet there is a thin film of carbonaceous matter that pervades the stone in such situations as we should expect to find traces of this membrane. Between the ribs a large surface of some thickness of this matter is apparent, having a lamellar and crystalline structure, that we may, with some reason, conceive to be the remains of the flesh and viscera. There is also a white calcareous substance lying upon the ribs, on their abdominal surface, and near the carbonaceous matter last described, that, with still more probability, may be referred to the excrements, which, consisting chiefly of the indigestible portions of the bones of the fishes and other matters that served for its food, would not be unlikely to

contain a large proportion of lime, in the form of phosphate and carbonate. The rarity of coprolites at Barrow, and their abundance at the mouth of the Severn, may be referable to certain differences in the nature of the food of the Ichthyosauri in these localities, that which contained the greatest proportion of bone and calcareous matter, affording, of course, the largest quantity of coprolite.

The structure of the head, teeth, and jaws, closely resembles that of the true Crocodiles, as distinguished from the Alligators. These are piscivorous, and, like the Porpoise, have their lower jaw in a single piece; but the Crocodiles, being bolder animals, and attacking their prey either on land or in the water, require a stronger construction of the two lower jaws, which, in order to fulfil this design, are composed of six bones on each side, so spliced together as to give the greatest degree of lightness and firmness combined. The number of teeth, which is about one hundred and eighty, is greater than in the Crocodile; and they are not enclosed in sockets, but lie in a groove of the jaw. As this structure renders them insecure, and liable to be displaced, in order to replace those that are broken or torn out, a constant succession of teeth is provided, that lie in a depression in the side of each of the old ones, which they push out by their growth, unbroken; whereas the new tooth of the Crocodile, being contained within the old one, splits it before it expels it from the jaw. The teeth and jaws form, at present, the specific distinctions of the Ichthyosauri; thus, we have the *Platyodon* and the *Tenuirostris*, &c.; but Mr. Hawkins and Mr. Owen consider that the paddles present more unfailing characters for the establishment of species. The nostrils, being placed almost immediately in front of the eyes, indicate that, like the Pike, the Ichthyosaurus fished by sight rather than by scent, and was probably equally voracious as that fish. Indeed, if we may reason from the size of the eye, which is very large in most predacious animals, it must have been the tyrant of the deep; for these organs are larger, in proportion to the head, than in any other of the finny tribes, except in a few of the smaller fishes. The sclerotic coat of the eye was composed, as in birds and crocodiles, of bony plates, that, ranged in a circle like the staves of a barrel, and being movable over each other, by their contraction and expansion increased or diminished the axis of the eye, and altered its range of vision from near to distant objects in air or water, according as the huge monster floated on the surface or remained submerged; when, by the immense quantity of light admitted through the enormous pupil, the deepest recesses of the ocean, or its most turbid water, were subject to its ken. Although the structure of

the jaws and teeth indicate great strength and voracious habits, yet this voracity must have been confined in its exercise to preying upon marine animals ; for the remarkable flexibility of the skeleton of its body deprived it of the power of moving upon land, except in a very limited degree. First, the head was fixed to the neck by a ball and socket joint, the most movable of all articulations ; next, the vertebræ, or joints of the back bone, were from forty to fifty in number, and instead of being connected together by broad flat surfaces, as in land animals, only touched at their edges, like those of fishes ; and the spinous processes, instead of forming a single piece with each vertebra, were jointed by their bifid roots into two holes, one on each side of the groove down which the spinal marrow ran. The paddles, also, consisting of numerous flat polygonal bones, ranged in a tessellated manner, were quite inadequate to the support of the Ichthyosaurus on land, though most powerful organs of motion in the water.

The ribs, equal in number to the vertebræ of the body, extended from the head to the pelvis, as in certain Lizards ; and about twenty of the upper ones were lengthened by what Mr. Conybeare terms the sterno-costal arcs, which were a set of bones, five in number, attached to each pair of ribs, that, in a manner resembling the stretchers of an umbrella, enabled the animal to extend and contract the dimensions of its chest to a degree to which we see nothing analogous among existing races of animals. In the Crocodile, however, whose sternum is prolonged to the pelvis, there is a set of intermediate bones, between the true ribs and their cartilages, that are connected to the sternum, which probably answer the same purpose.

The Ornithorhynchus, while seeking its food among the weeds at the bottom of the streams in which it dwells, is frequently obliged to rise to the surface to respire : it also burrows in the banks, like a Water Rat ; and hence, in order to increase the strength and elasticity of its fore legs, a bone, similar in form and function to the furcula or merry-thought of birds, is introduced between the breast and shoulder bones, to which it forms a most elastic *point d'appui*, while it keeps them apart, and antagonizes the powerful muscles that move the anterior extremities. Sir E. Home, in his *Lectures on Comparative Anatomy*, has given a representation, which Dr. Buckland, in his *Bridgewater Treatise*, has copied, of this peculiarity both in the Ornithorhynchus and Ichthyosaurus : but in the specimen we are describing, the flat central portion of the furcula is wanting, which arises, probably, from the bone having retained its cartilaginous state at the time of the animal's death—a supposition

that is supported by the want of the rounded knuckle in the humerus or arm-bone to fill the deep socket in which it was lodged.

The hind paddles are of the same shape, but are much smaller than the fore, and their terminal bones are lost. Of the tail, there are only a few joints remaining: but, judging from the increasing size of the vertebræ from the head to the pelvis, and by comparison with other specimens, we may conclude that the tail, when entire, was nearly as long as the body and head together. Its transverse processes are jointed to the spine, and the spinous processes are very broad and strong, indicating great power in this organ, as is observed in the Crocodile, with considerable extent of lateral motion, as in fishes.

The specific characters of the present specimen do not correspond to those of any of the species hitherto described. In the paucity of its paddle bones it resembles the *Ichthyosaurus platyodon* of other geologists, and to the *I. chieroligostonus* of Hawkins; but it differs from it in the pointed form of its teeth, and in the number of its dorsal vertebræ, that amount to forty-eight or fifty, whereas the vertebræ of the *I. platyodon* are only forty-four. It must, therefore, be considered as a new species; and we would suggest the name of *I. macrorachis*, as indicating its peculiar length of spine.

Besides the loss of the tail, and of the extremity of the nose, paddles, and of some of the ribs, the specimen presents the following injuries:—the crown of the head is crushed flat, the bony plates of the eyes are separated and dispersed, the jaws are pushed in contrary directions, and one of the bones constituting the right side of the lower jaw is broken. In the neck and back, the vertebræ are turned upon their axes, so that every rib is dislocated from its attachment, the ribs of the left side of the neck being thrown in a bundle forwards, while those of the body are very regularly disposed over the spine, with their heads in contact with the spinous processes, and their shafts lying diagonally across the right ribs that remain in contact with, though disjointed from, the spinal column. Wherever one bone has rested upon another, the superincumbent pressure has been sufficient to crack and break the upper one at the point of contact. This is the case with most of the ribs of the left side, the furcula, the coracoid processes, and the thigh bones.

The hollow cup-like interstices of such of the vertebræ as still remain in contact, are lined with dog-tooth crystals of carbonate of lime; but wherever they are at all displaced, the interval is filled up by the surrounding substance, now converted into limestone; and this is the case even with the most minute cracks and fissures

in the bones, proving beyond a doubt that the bones were broken while the enveloping matter was in a soft state, and that the flesh or skin was in a great measure, if not entirely, removed. The compressing force that produced these numerous dislocations and fractures must have been considerable, and, supposing the animal's body to have lain on its back or right side, passed in a direction from right to left.

As the present state of our knowledge of the mode in which the Lias clays and limestones were formed, amounts to little more than conjecture, it is not possible to give a satisfactory account of the cause of the death of the Ichthyosauri and other animals whose remains are found in such a remarkably perfect state in that stratum; but it is rather probable that, at Barrow at least, it may have been owing to sudden changes in the temperature and other conditions of the water, in consequence of volcanic action in the immediate vicinity of that part of the primeval ocean.

With regard to the nodular concretionary form of the stone in which the petrification is imbedded, an explanation may perhaps be found by a reference to what has been observed to occur in the mixture of Siliceous and Alumina with some Oxide of Iron, that forms the potter's paste, which, when allowed to settle, begins to form into lumps by the attraction of aggregation that the particles of Silica have for each other. This circumstance has been applied to explain the formation of flints in chalk; and with the knowledge of the property that the mortar made from Lias lime has to harden under water, and of the tendency to form the same kind of concentric nodules round any organic nucleus, so striking in the ironstone beds of the coal measures, it need not be a matter of surprise that similar nodules are developed in the Lias where the same ingredients meet together.

The following analysis by Mr. Southall of this town, of the various substances found in the fossil, shows decidedly that the process of petrification has not entirely removed their animal matter. The matters analyzed were the bones, the black matter that lay between the ribs, and the white substance supposed to be coprolite. The bones contain 75 per cent. of matter soluble in diluted nitric acid, and the residuum, which resembles ivory-black, yields, when heated, an empyreumatic oil, and when a strong red heat is applied, the greater part is consumed. Mixed with oxymuriate of potash, the residuum deflagrates in the same manner as a mixture of oxymuriate and carbon. Ammonia added to a solution of the bones threw down a copious precipitate; and the nitrate of silver threw down

a flocculent precipitate from the same solution. The black matter contains about 22 per cent. of carbon, nearly 60 per cent. of carbonate of lime, and about 5 per cent. of other solid matter, which is composed of oxide of iron, some silix, and a trace of copper. The rest, viz., 13 per cent., appears to be water. The white matter contains phosphate of lime, or bone earth, and carbonate of lime, besides a dark substance left on the filter, which swells and burns like animal fibre when placed on hot iron.

AN INTELLECTUAL MONSTROSITY.

BY J. L. LEVISON.

IN designating any person an *intellectual monstrosity*, the terms would seem at first to be so contradictory, that I can fancy many of the orthodox *literati* would ask what I mean by them; and, previously to the explanation, suppose that we intend describing an individual with very decided talent, but who is deficient in worldly sense. Yet such is not altogether the kind of character I intend sketching: and, in order to make peace with readers of all kinds, I will candidly confess that I adopted the terms *intellectual monstrosity*, because they convey to my ideas the tangible representation of just what I wish to treat of, without being under the necessity of either a circumlocutory mode of expression or of useless and minute descriptions. Besides, the terms convey in a forcible manner the notions entertained upon the subject by the generality of mankind. Still, the object of the present article would be misunderstood, unless I give a more definite meaning, and explain that my definition is something different from its strict and literal sense. I intend, then, to express, by the words *intellectual monstrosity*, a being who is generally regarded as a moral phenomenon—one of those extraordinary personages who is looked upon with awe or derision by vulgar minds, and with admiration or envy by the more cultivated classes. In short, an eccentric compound of wisdom and simplicity, who, like many others, has received the title by common consent of being a genius! Yet our *intellectual monstrosity* is of a different species from the mad-cap erratic persons who shield themselves

under the above title ; for it does not follow as a philosophical necessity, that he must do anything either injurious to others or annoying to himself. He may be harmless, kind, considerate ; or energetic, irascible, or dogmatic : but, whatever his temper, he is distinguished by one trait—he ventures to think for himself ! 'Tis true, he may be indebted for his acknowledged mental superiority to an original and vigorous cerebral organisation (as is the case of those persons who are called geniuses), or to his having concentrated his mental powers to one specific pursuit, which has enabled him to arrive at excellence in some art or science. It is very likely, however, that he may be less pleasing to a commonplace associate than if he had a superficial acquaintance with many subjects ; but if we look to the advancement of science, then his value is incalculably greater. If such a person investigates any science, he gives up every thing that may distract his attention, and the whole of his thoughts are concentrated for the attainment of the object. He differs from the *dilletanti* in the sciences, as he does not allow any ulterior pursuit to interfere with his fixed purpose ; hence he becomes the discoverer of new truths, or he is led to a clearer and more perspicuous view of those already known. And if *utility* is to be estimated, such a person is not only entitled to respect for his usefulness, but he merits esteem for his many privations and personal sacrifices. But it is a palpable truism, at which the heart sickens, that individuals who have been benefactors to their species, are, too often, victims of unmerited neglect, and very often, in days of yore, were punished instead of being rewarded. Even now, in our own boasted days of liberality, it is too often the case that men of talent suffer from poverty and unmerited neglect. Pensions are lavished on the *destroyers* of their species ; but he who exercises his mental powers for the benefit of the common-wealth must be satisfied with the scantiest fare. It must be confessed, that if an intellectual monstrosity is needy, he is ill adapted to guide his vessel safely o'er the stormy seas of life ; but, should his bark be wrecked, he is still less able to buffet the waves of adversity and disappointment, and his modest and noble spirit sinks in the unmerited struggle. If such a being should escape the ills of poverty or the insolence of the contumacious, it seems more than possible that he has a balance of happiness in his favour : for, if deprived of a well-earned reward for his various labours, he consoles himself for his many privations with the fond hope of posthumous fame ! This one thought compensates for every present difficulty, and cheers him on the thorny road of existence, even though his feet are bleeding and his body is wearied

from excessive fatigue. Let sordid men sneer at what they term ill-judged notions—let them compare their own wealth with his indigence, and their substantial and present comforts with his ideal and dreamy anticipations—the sum total is not in their favour. The intellectual monstrosity has not any *tedium vitæ*, nor is his body the rendezvous of diseases; and if we compare the moments of pleasure by their endurance, the balance is in his favour; for never can things of a mere sensual nature be compared to the pure and hallowed emotions experienced from the exercise of our moral and intellectual attributes.

The object of this essay is not so much to point out the weaknesses of men of talent, as to deprecate the contumely with which they are often treated by the possessors of wealth. The man of refined intellect who is poor, is still rich in mental lore, and he not only derives pleasure from the continual acquisition he can make to his stores, which are, in one point of view at least, more secure than the riches which the worldling prizes: intellectual wealth is imperishable.

But much depends on the spirit which stimulates a philosopher. If he is feverish for the applause of his cotemporaries, and if he mistakes their occasional attention to him as respect for his talent, he will find himself miserably deceived. It often happens that when a man of genius is invited to the tables of the wealthy, instead of its being from motives of esteem it results from a most unworthy and selfish motive. He is expected, for such condescension, to repay his host with compound interest, by the delivery of an oral lecture on his most favourite subject; and all this because he has the *honour* of an invitation to dine: hence, he not only teaches the master of the feast, but instructs or *amuses* the whole party, who obtain in this manner much valuable information without any of that personal fatigue which even the most gifted minds must experience during the laborious period of study. What annoys us most is, that often the ephemeral patrons of talent mistake their own selfish motives and confound them with the hallowed sensations of Benevolence. If this noble sentiment really influenced their conduct, they would show it by a different bearing. We have often been disgusted at witnessing the tyranny and insolence with which an intellectual monstrosity has been treated on such occasions of mis-called hospitality. Whatever may have been his favourite pursuit, it is attacked on all sides; some part of the company affecting to admire it, whilst others express their doubts as to its relative or positive importance. The stranger being thus unpleasantly annoyed or ur-

gently importuned, is in the predicament of a sensitive and noble animal under the stings of a number of busy insects ; for as soon as they discover his vulnerable parts, they contrive to suck him of all they want ; and when their curiosity is satisfied, it is not an unfrequent occurrence that the talented being is left to unmerited neglect, particularly if some butterfly of fashion flutters about, decorated with an extrinsic garb of superiority. And this arises because the intellectual monstrosity has soared too high for their weak mental vision. They gazed for a short time, but could not continue to do so, as their heads felt confused and dizzy. But if good manners shield our monstrosity from such impertinence, he is sure to be forgotten, or, what amounts to the same, uncared for as soon as the company separates.

What is worthy of remark, is the fact that, when an intellectual monstrosity visits the tables of the great, it is not a matter of choice with himself as to whether he will *lecture* or not. He is expected to use his best endeavours, for his hospitable host assures him that "the party anticipate the pleasure of hearing him," &c. It is, however, of some importance, that the philosopher thus forcibly *exhibited* should have knowledge of human nature ; for although he is expected to display his particular talent, yet should he be so deficient in worldly tactics as to begin to communicate his subject before any of the party have had their usual skirmishes, they become restless and inattentive, because it is obvious that "the curious creature" has been made acquainted with what would be expected from him, and they experience a kind of moral degradation, from a consciousness that they are acting improperly and unjustly to a man of worth. There is nothing so humiliating as being detected in some intentional act of insincerity : it is like the sudden exposure of heartless hypocrisy ; and as in the one case the blush is no surety of any subsequent moral consistency, so in the other the self-reproof which those of a party may feel does not induce them to treat such a person with marked kindness and attention. The probability, however, is that the intellectual monstrosity will have roused their indignation at the assumed discovery of their using him as a convenience, or as a something to amuse them for a time from his *newness*—that they may, under the effects of their curdled passion, spurt poison on the innocent offender, and charge him with an over-weening vanity, or, with impotent anger, declare him to be deficient in that *elevated* intelligence which enables a possessor to communicate knowledge without making it appear anything like an obligation.

It also very often happens that an intellectual monstrosity is not gifted with a fluency of speech, which causes him at times to hesitate, and thus his communications may be inelegant and disorderly, but still intelligible. Some specimens of this species are extremely modest, and they shrink from the gaze of the mere curious—the lovers of wonderful sights, and have a great repugnance to receive applause, however they may feel assured that they have merited it. But individuals of a common cast of mind can ill appreciate such a nobility of sentiment. Vulgar persons, judging from their own thoughts, cannot believe it possible that any one can act from a refined benevolence—a species of high morality which delights in communicating to others, without reward, the information which labour may have enabled the philosopher to obtain on those subjects of *practical* rather than *speculative* advantage, and which are important from their usefulness. The true lover of his species would use some effort to benefit, not only the unfortunate, but also such persons as are the victims of the lower feelings, whether they rank with the class of the *uneducated* or the *ill-educated*.

Yet, in imparting mental wealth, there is as much delicacy required as in dispensing the money of our country to the needy: the manner should be, in both instances, kind and ingenuous. For, if pride and coarseness are substituted, more pain is inflicted and more humiliation endured than even greater gifts could compensate.

It also often occurs that an *intellectual monstrosity* is of so retiring a nature that it is painful to him to be shewn up as a *lion* in any company; and if he is importuned to give the usual *expected* oral lecture, his greatness of soul shrinks from an intercourse with persons so devoid of moral delicacy. He therefore sits silent, chagrined and uneasy, and reminds us of some humble but fragrant field-flower transported to a gaudy bed of tulips; it is more likely to stand the severity of the storm and the tempest than its more showy companions, who were useless when perfect, and without the redeeming fragrance which the less decorated one possessed.

Among the instances of rather an amusing kind, we may relate the following, as corroborative of some of the above statements. Mr. Stone was very fond of Natural History, and being an enthusiast, with a clear and easy mode of conveying his information to others, he was in the habit of receiving very frequent invitations. His love of talking was, however, quite a fault with him, and he indulged in it to excess. He knew that he had the honour of a card for the purpose of *lecturing* to the party, and therefore he engrossed

all conversation* himself. Although his auditors were satisfied that he was well acquainted with the subjects he spoke upon, they could not help feeling annoyed at his being too communicative. Hence, instead of leaving a party who had friendly feelings towards him, he provoked their criticism, and called forth unfair ridicule to detract from his actual merit. Had he been more judicious, and allowed others to talk as well as himself, even although he displayed less varied knowledge, he would not have pained their Self-esteem, and he would have won their nominal and conventional esteem. People feel insulted if any thing like an invidious comparison can be made. The poor man does not feel gratitude when he is shown the splendour and luxury of the lordly domain ; nor do the superficial in mental acquirements entertain gratitude or respect when any one submits his intellectual stores in such profusion that their own poverty of ideas is thus unpleasantly forced into an unpalatable contrast. There are some persons, who may be regarded as exceptions, who, from an easy conversational manner, will frequently convey much information without making it seem any obligation. Mendelssohn says that such was the case with the author of *Nathan the Wise*, the illustrious Lessing.

I have been imperceptibly led to these lengthy remarks from a circumstance which occurred to me some years since. During a temporary residence in Norwich I was invited to a dinner party, to meet a great personage—a celebrated Chinese traveller—and great was my anticipation of the refined pleasure I should receive from his lecture or conversation (terms, under such circumstances, merely synonymous) on the manners and customs of the nations of the east. As soon as possible I hurried to the party, and quickly found myself in the drawing-room in a goodly company, and saw with mine own eyes the “lion of the day,” and, what is more, the worthy master of the feast formally introduced us. The traveller rose in a dignified manner, and with a graceful bow he returned my respectful salutation ; then he resumed his seat with much ease and propriety, and, bending his eyes on the carpet, gave himself up to his own cogitations.

Now I flattered myself on my physiognomical tact, and silently felicitated myself on a richer mental banquet than I had even anticipated. Dinner was at length announced, and a silent meal it was ; it might have passed for a Chinese repast, and would have done ho-

* This might appear a genuine bull, but I mean that he asked questions and answered himself.

nour to the renowned taciturnity of the Bonzes. The cloth was removed in due time, and the general gravity was slightly relieved by a simultaneous smile on the appearance of the wine and dessert. Still silence continued ; we sat in mute expectation, and at least one quarter of an hour had passed, and yet the stranger remained quiet ! he had the rudeness not to give us a lecture "on the manners, customs, and language of the Chinese people !" We looked at each other and winked significantly to our host, who appeared somewhat disappointed. We knit our brows : some of us eat of various things, to vent the accumulated feeling of irritation ; whilst others drank their wine quicker, and all looked angry at the traveller for his seeming indifference. In this way we were all under great excitement, and every one of us skirmished a little, partly to vent our spleen, and partly to induce the stranger to correct our apprehensions ; but all hints were thrown away, as he continued to sip his weak wine and water, apparently perfectly unconscious of the perturbation he occasioned us. What annoyed us the more was the fact that he occasionally smiled most provokingly (no doubt at some of his own reminiscences) ; but we could not opine whether he did so at us, or at his own mental associations. There was not an individual present who did not consider his conduct as an open defiance of an established custom, an infringement of a conventional rule established by long usage. What was more, we had actually been invited to meet the celebrated Chinese traveller, who would, in all probability, amuse us with his numerous adventures. But in spite of all this he had disappointed us, and appeared only a commonplace kind of personage ; and on our leaving we *unanimously* passed a sentence upon him "that he was a great bore !"

I subsequently discovered that this opinion was a very unjust one, and I now regard such conduct as was manifested by the party as a violation of true politeness and moral good breeding ; for we consider it as the acme of insolence to expect or ask a stranger to lecture to a large party because he has been invited to a dinner ! We were ourselves the real *bore*s, by not paying attention and respect to a worthy and talented man for his own sake, instead of that unmollified selfishness which prompts an individual, with something like a feverish anxiety, to treat such a talented stranger as a mental monstrosity, who ought to be exhibited to the gaze of the curious. It was, however, a lesson of some importance to myself ; for a few days after the above occurrence I had the privilege of dining with him at the house of the late talented and learned William Taylor, and it was indeed an interesting day—an epoch in my life ! for we

unsolicited received information on the state of China, its literature, its arts, government, morals, &c. ; and from that time I have felt a great veneration for an Intellectual Monstrosity, particularly when, like the traveller I have written of, he combines with great talent high and exalted moral perceptions.

*Hall Gate, Doncaster,
October 19th, 1837.*

OBSERVATIONS ON THE GEOLOGY AND MINING OF THE SOUTH STAFFORDSHIRE COAL-FIELD.*

THESE lectures were rather of a descriptive than a scientific character, as they contained many curious details respecting the mining and manufacturing operations, and the topography, of the district. The *first* was in great part devoted to a sketch of the facts observed by geological inquirers, and recorded as illustrative of the formation and progress of a coal basin. The probably heated and fluid condition of the earth at its first creation was assumed ; and the gradual hardening of its surface, the movements of the crust, through the expansive force of gases and vapour, the disintegration of the elevated portions, and the deposition of their elements, under new combinations, by the agency of water, explained. Fire, therefore, might be termed the disturbing, water the tranquillizing power ; and the action of both, proceeding through uncounted ages, alternately caused new elevations, and formed new compounds in the silent operation of deposition.

In the course of the long period of time thus occupied, the gradations of animal and vegetable life, suited to the progressive condition of the earth, were called into existence ; and thus a study of the remains and of the preserved forms of organized matter presented, to a certain extent, an historical record of the relative ages of

* Being the substance of two lectures lately delivered at the Athenæum, in Worcester, by Mr. W. Hawkes Smith, of Birmingham. These lectures were attended by numerous audiences, who received them with marked satisfaction. Discourses of this kind are well-calculated to promote the spirit of generous emulation and inquiry.—ED.

different deposits ; and these remains had received the appropriate designation of "medals of creation."

Similar was the process in a confined area like that under consideration. It must be conceived of as covered by the waters of a deep ocean, extending indefinitely on every side, and of which the floor of limestone and other inferior strata, was gradually covered with deposits of various rocky materials, carried down from distant and previous elevations. The accumulated strata, with the solid limestone on which they rested, were themselves elevated at certain points, till high ridges rose above the waters. The *debris* from these hills was, by continued aquatic operation, carried into the concavity or trough ; and the hills themselves became, in due course, clothed with luxuriant vegetation, vast accumulations of the matter of which, in different stages of decomposition, were perpetually washed down, and took their place as definite deposits, which, buried under successive earthy layers, and subjected to the chemical and mechanical action of heat and pressure, took the form of that which we now call *coal*. Among other beds deposited in this trough or basin were also clayey sediments, charged with metallic particles, which, in process of time, took their present form of strata of iron ore, or, as it is commonly called, *ironstone*, which occur at different depths in the coal formation. The vegetable origin of coal was abundantly proved by the prevalence of carbonaceous matter in its depositions, and by the numerous remains which pervade every part of its mass ; and the existing high temperature of the earth's crust was also inferable from the nature of the plants discovered, which were at once pronounced, by the botanist, to bear a distinct relation to those now known to belong to tropical climates. Thus, the once deep sea or lake was gradually filled up with sedimentary washings from high lands. But it was not in this evenly disposed form that the successive layers offered themselves to the miner. A series of movements, similar to those of the earthquake and the volcano, broke up the accumulated strata to an unknown depth ; placed contiguous portions of the same deposits at the most discordant levels, and exhibiting the ocean beds of thick limestone, in highly inclined positions, as the principal constituents of abrupt and lofty eminences. That these movements took place after the deposition of all the characteristic strata had taken place, was clear, from the circumstance of the same measures being successively reached, in the same order, in places where they lay at extremely different distances from the surface.

The lecturer illustrated his subject by reference to several effec-

tive drawings, some of which were contrived, by means of moveable parts, to exhibit the gradual progress of the changes of which he spoke; one of the most striking of these was a map of part of South Staffordshire, which anticipated one of the suggestions of Mr. Wyse for facilitating the comprehension of geological topography. It exhibited at first a uniform colouring, expressive of the red sandstone with which the surface is covered; and several layers were successively removed from the part indicative of the coal field, coloured so as to give an idea of the coal, the rock measures, the ironstone, the clays, &c., down to the prevalent bed of limestone; portions of the layers being cut out, in order to exhibit, in their proper situations, the coal, the basalt, and the lime, which are occasionally seen at the surface.

The *second* lecture was commenced by reference to a large and elaborately-constructed section, formed on careful observation and inquiry, and presenting a general idea of the condition of the strata through the coal field, could they have been examined immediately after the great elevations and depressions of their parts. A removal of a portion of the drawing exhibited afterwards to the eye, in a lively manner, the new line of surface, shewing the result of the gradual operation of air and water, in reducing the rough and precipitous ridges, filling up deep cavities, and producing the undulating line which now prevails.*

The relation of such a spectacle to the evenly deposited strata of a coal basin, in its original form, was pointed out, and the numerous interesting geological facts included within the range of the section adverted to; shewing instances of dislocations or "faults," by which the corresponding measures were thrown to a difference of level, amounting, in some instances, to a hundred yards; fissures or "dykes," filled up with injected veins of originally fused matter, now bearing the form of hard and closely-grained rock, interrupting the work of the miner, and occasionally bursting through the entire strata, and forming hilly protuberances on the surface; the elevations of the solid ribs of limestone into the *anticlinal* position, or sloping each way, at the Wren's Nest and Dudley Castle Hills, where these ocean beds are raised to angles of thirty, fifty, and eighty degrees; the coal measures, uniformly prevalent over the cavity of the basin, but broken and dispersed at the elevated ridges, dividing

* This magnified section was, in fact, with more of detail, generally similar to the one which is given by Mr. S. in his *Birmingham and its Vicinity*, and which will be found in our number for April, 1837, accompanying a notice of that work.—ED.

and becoming of considerable magnitude towards the south-west, and cropping out and losing themselves on the north-east side.

The lecturer then proceeded to describe in succession, the valuable deposits and the mode of working them in different situations. Of the *limestone*, two beds, of twelve or fourteen yards thick appear to prevail beneath the coal formation. It is of the period termed by Buckland *transition*, and abounds in the forms of *Trilobites*, *Encrinites*, and a variety of *Crustacea* and *Zoophytes*. It appears at the surface near Walsall; forms a range of considerable hills from Sedgely to Dudley, and is again seen at the Hayes, near Stourbridge. Its elevation and its excavated quarries afford many strikingly picturesque points of view, which were illustrated by large drawings; one of which, presenting the present aspect of the Wren's Nest, was adapted, by a removable piece, to exhibit a section of the hill, shewing the workings of the strata, their position, and the line of subterraneous canal constructed by the proprietor for facilitating the transit of the heavy material. The limestone is detached from its bed by the gunpowder blast, and is, in some situations, worked, like coal, by means of deep pits or shafts.

Above the lime, at a considerable distance, lie the *Coal Measures*, of which the following table gives the total thickness of the *getable* beds, or those which pay for working:—

	Y.	FT.	IN.
Brooch coal	1	0	9
Thick coal	10	0	0
Heathen coal	1	0	0
New mine	8	2	3
	<hr/>		
Yards	21	0	0
	<hr/>		

Of these, the most important is generally known by the descriptive title of "Ten Yard Coal." This is composed of numerous beds of varying qualities, separated by thin "partings" of sand or clay, and it is worked by the miner in five or six sections or stages, commencing with the lowest; large quantities, however, are left in the mine, as pillars for supporting the roof, and as heaps of unsaleable slack.

The thinner beds are more nearly cleared away; the superincumbent earth being supported by conical pillars, or "cogs," of refuse and waste. In all cases, a series of small passages for ventilation, called "air-heads," is carefully formed: these follow the en-

tire extension of the work, they are about three feet square, and various contrivances are adopted to promote the circulation of a stream of pure air through the cavities of the mine, both for the purpose of ventilation, and for the extrusion of the deleterious gases and vapours, which so frequently, in spite of all precautions, cause tremendous and destructive explosions. Another enemy of the miner is the *water* which is generally found in mines. This is carried by channels or passages, to a general reservoir, or "sump," from whence it is raised to the surface by a steam-engine.

The *ironstone* is found in beds of three to five feet thick; sometimes in the form of continuous strata or 'flats,' but most frequently as nodules of different sizes embedded in matrices, of coarse clay. It is entirely cleared; a plentiful supply of matter for supporting the roof being found in the stony and earthy refuse. In the mines both of coal and ironstone, the "gate-roads," or passages of access, are driven, *at first*, to the extremity of the proposed area, and the work then proceeds "homeward," thereby avoiding the difficulty and danger attendant on keeping open and continually re-entering the cleared parts.

Another mineral substance, of less value, but still of considerable importance, is the *Fire Clay*, which abounds in various situations, but is procured of the best quality in the neighbourhood of Stour-bridge. Its superiority consists in its almost entire freedom from admixture with oxide of iron, and its consequent power of resisting extreme heat. This property renders it highly useful for the lining of smelting furnaces, and for crucibles and other vessels used in the making of glass, and in melting of metals for the founder. The mode of clearing out the clay is similar to that of the ironstone.

The iron-ore is an aqueous combination, in which the metallic particles are mixed with large quantities of argillaceous matter, and the science of the chemist is appealed to, in order to discover a substance which, uniting itself with the clay, should set free the metal. Such a substance, possessing the desired affinity, is the limestone, which is accordingly thrown into the furnaces with the coal and ironstone, when the metal runs off below, and the mixed matters form a species of imperfect glass, which is suffered to escape by passages contrived for the purpose.

The lecturer here introduced a detailed account of the operations of the iron-furnace, the forge, and the mill, to which, however, we can only thus allude. He then adverted to the remarkable features presented, in certain situations, by the pyrogenous rock already mentioned, which forms a line of hills commencing where the lime-

stone hills terminate, near Dudley. This is a species of *basaltic larva*, and takes various forms according to the mode in which it was cooled after ejection from its deep sources. The only purpose of utility to which it has been applied, is that of paving-stone; and having been usually procured from the quarries near the village of Rowley Regis, it has received the vernacular denomination of Rowley Rag. When met with in the form of dykes and veins, it is called by the miners "green rock." It is extremely hard, is slightly affected by the magnet, and consists of about five parts of siliceous, three of alumina, and two of oxide of iron. At Rowley, and Barrow-hills near Dudley, it occasionally exhibits the vertical columnar form; and at Pouck-hill, near Walsall, the columns are singularly well defined, but their position is nearly horizontal. The present state of the basaltic hills presents many picturesque groupings, of which the lecturer was able to point to some striking instances in large coloured views of scenery at Barrow and Pouck-hills.

In reference to the probable continuance of the supply of coal, he ventured to offer some calculations on the state of the mines; inferring from the immense quantities consumed—probably not less than the entire produce of an acre per week in the mining and iron works alone;—from the separated position and inconsiderable thickness of the "ten yard" measures in certain situations, and from the problematical result of the bold experiments now carrying on by Lord Dartmouth at Westbromwich, that the coal basin is in reality circumscribed, and its contents not so inexhaustible as some writers have deemed it to be, or as, from the present unrestricted, perhaps wasteful, consumption of an unrenovable store, would seem to be expected.

In conclusion, the attention of the auditors was briefly called to the reflections naturally suggested by the examination of such a page in the volume of Nature as had been opened in these lectures, and in which the observer could not fail to perceive that, by the operation of what are called laws of Nature and natural causes, several useful materials, closely allied in their adaptation to the service of man, have first been successively deposited within a prescribed area, and then removed and disturbed so as to render them accessible to human industry; thereby, as in every section of the works of Nature, exhibiting proofs of beneficent intention, as well as design, intelligence, and power on the part of the creating mind.

SKETCHES OF EUROPEAN ORNITHOLOGY.

GOULD'S "BIRDS OF EUROPE."

PARTS XI. AND XII.

PART XI.—This plate contains a good representation of a queer-looking bird, the Ural Surn, *Surnia Uralensis*—Hibou de l'Oural, Fr.—being a male, figured somewhat under the natural size. It is a very scarce bird, and one about which little is known. Mr. Gould believes that its general habits entitle it to a place in the genus *Surnia*; but an inspection of the plate before us, and especially the great development of the facial disk, makes us but ill satisfied with that arrangement. If it is to be a *Surnia*, assuredly it is a most aberrant species; but we cannot reconcile ourselves to classing it in that genus at all. Occurs, though sparingly, in the northern regions of Lapland, Siberia, Sweden, and Norway; is somewhat more plentiful in Hungary and Livonia, but is every where scarce, and is supposed to be confined to the Old World. Feeds on Levetts, Rats, Mice, Ptarmigan, &c. Builds in the holes of trees, and lays two white eggs. The sexes are similar, but the ground colour in young birds is lighter than in adults.

Little Plover, *Charadrius minor*—Petit Pluvier à-collier, Fr.—Kleiner Regenpfeifer, G. An adult and a young bird of the first autumn are very well figured. Science is indebted to Mr. H. Doubleday, of Epping, for the addition of this little species to the British fauna, a specimen having been taken at Shoreham, in Sussex. "From the extreme youth of the individual transmitted to us, it is clear that it must have been bred on the spot; and it is worthy of notice that the person who killed it affirms that he has long suspected the present bird to be a resident on that part of the coast," having noticed a peculiarity in the note of the species. It is abundant in the south of Germany as far as Italy, frequenting large rivers. Mr. Gould positively states that the American specimens he has examined are specifically different. Resembles the Ring Plover in habits, and constructs its nest among shingles on the water's edge; lays four or five yellowish-white eggs, blotched with black and brown. The sexes do not differ, but young birds want the black collar. This species is easily distinguished from the Ring Plover by its small size.

An adult, natural size and well-figured, of the Dalmatian Nut-

hatch, *Sitta rufescens*, Temm. Mr. Gould introduces to the public the Dalmatian Nuthatch as a new European species, being now for the first time figured. "The Dalmatian Nuthatch is an inhabitant not only of the country from which it takes its name, but also the whole of the south-eastern portion of Europe generally; indeed, to this section of the globe it appears to be strictly limited. In its general style of colouring, as well as in its form, habits, and manners, it exhibits a striking resemblance to the *Sitta Europæa*." Of its nidification nothing is ascertained. The magnitude of this bird, as our author justly observes, sufficiently distinguishes it from the rest of the genus. The sexes are similar.

Knot Tringa, *Tringa canutus*—Bécasseau canut, Fr.—Chiurlo, It.—Aschgrau Strandläufer, G. Adults in summer and winter plumage are given; we do not admire the plate so much as many we have seen, but still we perceive no radical fault in it. Mr. Gould, on the authority of Cuvier, separates this species from *Tringa*, without, we think, sufficient grounds for so doing. The Knot Tringa is not resident in Britain, but abounds with us at certain seasons. Frequents the sea-shore or the fenny parts of the country, where it breeds. Common in the arctic regions of both worlds, ranging throughout the circle. In England the Knot is much sought after, by the epicures, for the table. The seasonal changes are remarkable, the whole of the reddish tint which adorns both upper and under parts of the summer attire giving place, in winter, to a plain ash-gray and white tint, whence the German appellation of *Aschgrau Strandläufer*. The sexes differ little; but what is curious, and what was previously unknown to us, is that, according to Mr. Gould, "the female is the finest in colour and the largest in size."

Fantail Reedling, *Salicaria cisticola*, Gould—Becfin cisticole, Fr. Mr. Gould places this bird, provisionally, in the genus *Salicaria*, but we believe it will not long remain there. The design of the plate, representing the female in her nest among the tall herbage, on a stalk of which her mate is perched, is admirable. Inhabits the southern and eastern parts of Europe, and the adjoining portions of Asia and Africa. "It frequents low and swampy places covered with tall grasses, and," like the Marsh Reedling, "constructs a nest pre-eminently curious and beautiful, excelled by none of a similar character. Although incapable, from its small size, of entwining the larger reeds, it avails itself of the tall blades and stalks of grass, among which it places its nest; these it does not draw together" in the manner of the Marsh Reedling, "but by piercing each

blade, and drawing the whole together by means of cottony threads, secured at each perforation by a knot so ingeniously executed as to appear the work of reason.* Between the grasses thus secured it places the body of the nest, which is composed of vegetable fibres lined with a kind of flocculent down, collected from various plants." The eggs are four or five, and of a bluish flesh-colour. "When disturbed it takes long flights, chirping all the way with a remarkably loud and shrill note; and when in motion it erects the tail and spreads it in a circle, which appears very beautiful." The male only differs from the female in having the tail somewhat more elongated.

Ash-colored Harrier, *Circus cineraceus*—Busard Montagu, *Fr.*—*Falco rossiccia*, *It.*—Halb Weyhe, *G.* Splendid representations, natural size, of the male and female. This bird is easily distinguished from the Hen Harrier by the superior length of its wings. Tolerably abundant throughout Europe, including Britain, but especially the southern districts. Feeds on small mammalia, Snakes, Frogs, Lizards, &c. Nidicates on the ground, among any kind of shelter suited to the purpose. Its flight is peculiarly buoyant and graceful. The female wants the ash colour of the other sex, and the young birds are of a more uniform plumage than adults. It is well known that the discovery of this bird as a distinct species is due to the zeal of our countryman, the late Colonel Montagu.

Hedge Alp, *Pyrrhula vulgaris*—Bouvreuril commun, *Fr.*—Rothbrustiger Gimpel, *G.* Mr. Gould figures the male and female, natural size. We really must, in this instance, withhold all commendation from the plate lying open before us. The Hedge Alp, or Bull Finch, is too familiar to need any description.

Stone Thicknee, *Ædicnemus crepitans*—Ædicnème criard, *Fr.*—Gran Piviere, *It.*—Graue Regenpfeifer, *G.* Of five or six known species of *Ædicnemus*, this is the only one that inhabits Europe. It arrives in Britain in spring, frequenting stony moors; it is found in similar localities in the south and east of Europe, and the adjacent portions of Asia and Africa. Makes no nest, but lays two eggs amongst loose stones; the young run as soon as they are hatched. Feeds on Slugs, Worms, Mice, reptiles, &c. The Thicknee runs very swiftly. The sexes are similar, and the young birds soon assume the adult plumage. The figure, of an adult, natural size, is excellent.

Egyptian Neophron, *Neophron percnopterus*—Catharte alimoche,

* But being in fact the work of *Constructiveness*.—ED.

known Reed Bunting, but the beak, being considerably stronger, points it out as an aberrant member of the genus. Inhabits the marshes of Tuscany, and its habits are said to be similar to those of *E. scheniculus*; nidification unknown. The sexual and other changes of plumage are also the same as in the above-named species.

White-headed Undine, *Undina leucocephala*, Gould—Canard couronné, *Fr.*—Anatra d'iverno, *It.*—Weisskopfige Ente, *G.* We do not find the freedom of Nature in the plate before us, representing an adult male, size of life. We perfectly agree with Mr. Gould as to the propriety of instituting a new genus for the reception of this singular species, which could not even be included in *Hydrobates*, Tem. The White-headed Undine is abundant in, and almost confined to, the eastern countries of Europe, where it inhabits salt waters, and arms of the sea. So entirely aquatic are the habits of this species—whence the generic name, both Latin and English—that the nest is so constructed as to float on the water; and, although the facts are not ascertained by actual observation, the structure of the bird, as our author very properly observes, leaves no doubt but it is an expert diver, and that it swims with the body almost entirely submersed. Feeds on molluscs and insects. The female only differs from the male in having the general hue of the plumage of a duller tint.

Laughing Xeme, *Xema ridibundus*—Mouette rieuse, *Fr.*—Gabbiano moretta, *It.*—Lach Meve, *G.* It is a native of Holland, where it is always abundant, but is a bird of passage in France and Germany; also common in Britain. Frequents marshy islands in the neighbourhood of the sea coast and similar localities. Subsists on insects, mollusca, small fishes, &c., and resembles the Gulls in its habits. The nest is placed on the ground, on flat lands, and often at a considerable distance from the sea. The sexes are similar, and the winter plumage resembles that of summer, but young birds only attain the adult attire after the moult of the second autumn. The plate represents an adult and a young bird, natural size, and few of Mr. Gould's figures surpass these before us in truth and beauty.

On the next plate are given figures of the Coal Tit, *Parus ater*—Mésange charbonnière, *Fr.*—Cinciallegra minore, *It.*—Tanne Meise, *G.*; and Marsh Tit, *Parus palustris*—Mésange nonnette, *Fr.*—Cinciallegra cinerea, *It.*—Sumpf Meise, *G.* The latter much the best. These two species are widely distributed over Europe, and are abundant in Britain. The Coal Tit is distinguished by the

white patch at the back of the head. Both these birds possess a monotonous song, although the circumstance is not mentioned by Mr. Gould or any other ornithologist.

Common Ptarmigan, *Lagopus mutus*—Tétras ptarmigan, *Fr.*—Pernice Alpestre, *It.*—Hasenfüssige Waldhuhn, *G.* The figures, of adults in summer and winter plumage, though good, are not quite what we could have wished. It is well known to the majority of our readers that this bird becomes wholly white in winter, and of a mottled brown in summer, the plumage in the former case assimilating with the snow of its native mountains, in the latter with the moss and heath which it frequents. Abounds in the mountainous districts of central Europe, and is also found in the northern districts; likewise occurs in North America, and the mountainous parts of Scotland. It incubates early in spring, laying fifteen white eggs mottled all over with purplish brown. The young resemble the female. The male is somewhat larger than the female, and has the black streak on the cheek more intense.

White-winged Tern, *Sterna leucoptera*—Hirondelle-de-Mer leucoptère, *Fr.*—*Sterna nera*, *It.* A beautiful figure, natural size, of an adult. Confined to the south of Europe. "In habits, size, and structure, it strictly resembles the Black Tern; the pure whiteness of its tail, and the greyish white of its wing, will, however, serve at once to distinguish it from that species." Feeds on insects, worms, and small fishes. The sexes are similar, but young birds have less white on the wing.

Little Xeme, *Xema minutus*—Mouette pygmée, *Fr.* Two very good figures are supplied; representing an adult in winter attire, and a young bird, of the natural size. This little species is very rare in Britain, its true habitat being the east of Europe. Mr. Gould affirms that it never occurs in America. In summer the adults have the head black, and the young resemble the full-grown individuals in winter, but the red of the beak and legs is less intense. "Its flight is as light and buoyant as can well be imagined, and its general actions and form resemble those of the rest of the genus."

PART XII.—Common Nuthatch, *Sitta Europæa*—Sittelle torche-pot, *Fr.*—Piochio grigio, *It.*—Kleiber, *G.* Mr. Gould's figures of a pair of these birds, natural size, are good, but rather too robust. Inhabits Europe, over which it has a wide range. In many of its habits the Nuthatch closely resembles the Woodpeckers, but it differs from them in being able to run up and down the stems of trees, during which process it may often be approached with ease. "The

position with the head downwards appears to be the most easy and natural. It not only assumes this attitude when alighting on the trunk or limb of a tree, but hammers at the bark or splits a nut in the same position. * * Insects, nuts, and various berries constitute their food. Their incubation is performed in the holes of decaying trees." The nest consists of dried leaves, and the eggs, seven in number, are greyish white with reddish spots. "The female is assiduous in her task, and defends her nest with her bill and wings, hissing at the same time in token of anger." In winter the Nuthatch frequents orchards and gardens in quest of food. The sexes, and also young birds, are similar.

Black-throated Diver, *Colymbus arcticus*—Plongeon lumme, *Fr.*—Polar Taucher, *G.* Fine representations of a male in full plumage, and a young bird of the year, three-fourths of the size of life. Extends throughout the arctic circle, frequenting inland waters and small lakes. This bird was first discovered to breed in Britain by our indefatigable countrymen, Sir W. Jardine and Mr. Selby, in the wilds of Sutherlandshire. Feeds on fish, crustacea, &c. The nest is placed close to the water; the eggs, two in number, are dark olive-brown, blotched with black. "When the inland lakes of the northern climes become frozen, the adults retreat to the ocean, where they brave with impunity the coldest winters. Their power of diving is remarkable, not more for swiftness than for the long time they are capable of continuing submersed: it is this amazing power that enables them to avoid with the greatest ease every artifice of man to capture them on the open sea or large lakes." The sexes do not differ, but young birds are of a much plainer hue; they "undergo three moultings before they attain their full colouring."

Hooded Crow, *Corvus cornix*—Corneille mantelée, *Fr.*—Corbachia mubachia, *It.*—Nebel Rabe, *G.* Common in all the mountainous portions of the continent, but especially Scandinavia. Abundant in many parts of England, and resident in Scotland. "It frequents the shores of the sea, the banks of large rivers, extensive downs, and such arable lands as are devoid of hedge-rows. It is seen in pairs, or three or four together. Feeds on almost every thing that comes in its way, including carrion, insects, &c. "Is abundantly dispersed along the banks of the Thames, and all such rivers as are under the influence of the tides. During the period of incubation they are said to be very destructive to the eggs and young of the Red Grouse, and will even attack lambs and Sheep. The eggs are four or five in number, of a greenish ground colour,

mottled with dark brown. The sexes are alike in plumage, and the young attain at an early age the colouring of their parents. The plate represents, in a beautiful and faithful manner, an adult male, natural size.

Dalmatian Kinglet, *Regulus modestus*, Gould. "A single specimen of this interesting little bird has been sent to us by the Baron de Feldegg, of Frankfort, to whom our acknowledgments are due, not only for this instance of his liberality in consigning to our care, at the risk of loss and injury, a bird probably unique in the collections of Europe, but for many similar instances of disinterested generosity.—The only history of this bird which we have been able to collect, was that written on the label attached to it by the gentleman above mentioned, and is as follows:—'I shot this bird, which on dissection proved to be a male, in Dalmatia, in the year 1829.' Its most conspicuous characters are the three yellow stripes which ornament the head; the brighter and most highly coloured of these marks, contrary to what obtains in any of the other *Reguli*, being that over each eye, while the coronal stripe is palest, and consists of feathers similar in length to those which cover the rest of the head." The same bird is, very judiciously, figured in two different attitudes, "to exhibit more clearly its characters and colouring." The lower figure is a perfect gem.

Common Coot, *Fulica atra*—Foulque macroule, *Fr.*—Schwarzes Wasserhuhn, *G.* The Coot is abundant in every part of Europe, but especially in Britain, Holland, France, and Germany, residing on large sheets of water abounding with Irises and other herbage. The nest is generally built just above the surface of the water, among the rushes, and is formed of the above-named and other plants. The eggs, from seven to ten in number, are of a chocolate colour, spotted with dark brown. The young take to the water almost immediately they are hatched; they are covered with black down, and have a red sealing-wax-like substance on the head. "When winter covers the ponds, lakes, and canals with ice, thus cutting off every needful supply, the Coot leaves its secluded quiet haunts of summer, and seeks the wide stream of the larger rivers, venturing even as far as their embouchures in the sea." This bird runs and dives with facility, but is rarely seen on wing. Feeds on Worms, Slugs, aquatic insects, seeds, &c.; we have also known it eat small fish. There is little or no difference of sex or season. We are very well pleased with the figure, of an adult, rather under the natural size. We think Mr. Gould might have managed to represent it of the size of life.

Bramble Finch, *Fringilla montana*—Grosbec d'Ardennes, *Fr.*—*Fringillo montanino*, *It.*—Berg Fink, *G.* The figures, of an adult male and female, are faithful portraiture. The Bramble Finch is abundant in all the elevated districts, being resident in some countries, migratory in others. In England it is not a common bird, and is only met with in winter. British specimens may, however, be seen in every collection, and we have met with several individuals in Yorkshire and the midland counties. "They appear to evince a decided preference to woods of Beech, on the mast of which they for a time subsist, feeding also on various seeds and the shoots of tender vegetables. Although it is very probable that a limited number remain to breed in the northern parts of this island, yet we have never been able to verify the fact. It is said to incubate in forests of lofty Pine and Spruce, the nest being composed of moss and wool, lined with feathers and hair. The eggs are white, spotted with yellowish brown, four or five in number." The colours of the female are less bright than those of the other sex, and the parts which in winter are brown in the male become black in summer.

Peewit Lapwing, *Vanellus cristatus*—Vanneau huppé, *Fr.*—*Paoncella commune*, *It.*—Gehäubte Kiebitz, *G.* Abundant throughout Europe, frequenting swampy places, wide moors, and stubble lands, and being at once distinguished by its peculiar cry and elegant and varied evolutions on the wing. Also occurs in India and Africa, but is restricted to the old world. We are a little surprised to find Mr. Gould characterizing the flight of this bird as "heavy, flapping, and apparently performed with considerable exertion." Surely the author cannot be speaking from personal observation.—Lays four eggs, olive colour and blotched with black, on the bare ground. Feeds on Worms, Slugs, and insects. The young birds, which are hatched early in spring, make a noise greatly resembling the well-known *peewit* of the adults. The male is brighter than the female, and his black throat changes in winter to white. The young attain the adult plumage in the second year. The figures, representing a male and female in summer and winter plumage, are rather too green, but otherwise good.

Citrel Siskin, *Carduelis citrinella*—Grosbec venturon, *Fr.*—Citronen Fink, *G.* Very pretty figures of a pair of these elegant birds. Never seen in England, but common in the mountainous districts of southern Europe, building on the branches of the Larch and Fir. Lays four whitish eggs, with numerous brown blotches of various sizes. Feeds on the seeds of Alpine plants. It is reported to be a

fine songster. Its habits bear a considerable resemblance to those of the Green Siskin (*Carduelis spinus*). "The female is rather less in size, and her colours are not so vivid as in the male."

Willow Ptarmigan, *Lagopus saliceti*—Tétras des saules, *Fr.*—Weisse Waldhuhn, *G.* Easily distinguished from the Common Ptarmigan by its superior size, and the rufous tinge of the summer plumage. The changes of plumage are as in the other species. The figures, of adults in different states of attire, size of life, are quite to our liking. Inhabits the north of Europe, becoming gradually less abundant towards the south, frequenting the mountainous districts. Feeds "during summer on the tender shoots and buds of Heath, together with berries of Alpine plants: in winter, when the face of the country is covered with snow, it burrows beneath the surface, and feeds on the scanty herbage, the buds of the dwarf Willow, and whatever vegetable food it can obtain." Builds on the ground, among tufts of herbage; the eggs, from six to ten in number, much resemble those of the Common Ptarmigan, but are, as might be anticipated, larger. The sexes resemble each other: the first plumage of the young is coloured, which at the autumn moult is exchanged for white."

Rock Swallow, *Hirundo rupestris*—Hirondelle de rocher, *Fr.*—*Hirundo cauda-non-furcata*, *It.* The representations, of a male and female, appear to be very good. Abundant in the south of Europe. It is larger than our Sand Swallow, which in plumage it much resembles. The tail of this bird, as the Italian synonym we have quoted attests, is not forked. It builds in the holes of rocks; the eggs, five or six, are white, with minute dots. Its food and general habits are similar to those of *H. riparia*. The sexes do not differ.

Pied Chat, *Saxicola leucomela*—Traquet leucomèle, *Fr.* Is abundant in the north of Europe, and although little is known of its habits, these are probably similar to those of its congeners. "Temminck informs us that so exclusively boreal is this species, that it is never seen in temperate climates; which leads us to infer that Siberia, Upper Tartary, and the most northern portions of Asia, will prove to be countries of which Nature has destined this bird to be a native." Those parts which are black in the male are brown in the female. A very fair figure of an adult male, natural size, is given.

Glossy Ibis, *Ibis falcinellus*—Ibis falcinelle, *Fr.*—Chiurlo, *It.*—Sichelschnabliger Nimmersat, *G.* This is the only Ibis occurring in Europe, where it inhabits the southern and temperate regions, but is very rarely found in England or Holland; is abundant along the course of the Nile, and in the adjacent provinces of Africa. Feeds,

like its congeners, on Worms, Slugs, Lizards, fresh-water mollusca, and aquatic vegetables. "The graceful proportions of this bird, the elegance of its actions, together with the resplendent lustre of its plumage, render it one of the most interesting of the Waders; and we regret that our knowledge of its habits and manners is so imperfect that of its nidification and eggs we can give no certain information." The sexes are similar; the young birds are dusky before the second or third year. A very fine figure of an adult male, three-fourths of the natural size, is given.

Lesser Woodpecker, *Picus minor*—épichette, *Fr.*—Picchio minore, *It.*—Kleinste Specht, *G.* Pretty figures, natural size, of an adult male and female. This bird, as our author justly observes, is the smallest of the European species, but is superior in size to some found in other portions of the globe. The appellations *lesser*, *minor*, *minore*, and *kleinste* (least), are, therefore, erroneous, though it would scarcely be worth while to alter the name. Is confined to Europe, over the whole of which it extends, being found in parks, woods, and orchards, where it climbs the trunks and branches of trees with great agility. Mr. Gould says it is much commoner in England, especially the south, than is generally supposed. In spring it utters an oft-repeated single note, resembling that of the Wryneck. Lays, in the holes of trees, four or five pure white eggs. The crown of the head, which is scarlet in the male, is white in the females. Young birds resemble the adults.

Tufted Pochard, *Fuligula cristata*—Canard morillon, *Fr.*—Anatra col-ciuffo, *It.*—Rheier Ente, *G.* The plate represents a pair of these birds, rather less than the natural size. Mr. Gould is peculiarly successful in his illustrations of water birds, more especially the *Anatidæ*, and the plate before us yields to none we have seen in truth and beauty. The Tufted Pochard is a regular winter visitor in Britain, distributing itself over our lakes, arms of the sea, &c., being mostly seen in pairs, "repeatedly diving in search of food, which is obtained exclusively at the bottom of the water, and consists, for the most part, of various fresh-water shell-fish, crustacea, Worms, and mollusca; to this food it occasionally adds vegetables. On the approach of spring it retires northward to breed, and makes the morasses and the unfrequented regions of the arctic circle an asylum in which to rear its young. The range of its migrations southward is very considerable. The Tufted Duck is brought to the London market in considerable numbers during the winter." The colours of the female are more dusky than those of the male; the young have no tuft on the head.

Alpine Chough, *Fregilus pyrrhcorax*. The plate contains a very spirited representation of an adult, natural size. In general appearance this species bears a remarkable resemblance to the Garden Ouzel (*Merula vulgaris*). Inhabits the precipitous elevations of the Alpine districts of Central Europe. "During summer it seldom descends far below the line of perpetual snow, but in severe winters it is sometimes driven to the lower mountain ranges, more, perhaps, in order to obtain food, than to avoid the severity of the cold. Berries, grains, insects, Worms, &c., constitute its food; it is, indeed, almost omnivorous." Builds in fissures of rocks or holes in old walls; the eggs, from three to five, are dull white, blotched with yellowish-brown. The sexes are similar, but the black is less pure in young birds, and the bill, orange in adults, is blackish.

White-fronted Goose, *Anser albifrons*—Oie à-front-blanc, *Fr.*—Oca Lombardella, *It.*—Blassen Gans, *G.* The figures, of an adult and a young bird of the year, are faultless. This bird passes the summer in the northern latitudes of both worlds, where it also breeds; migrates southwards in autumn, great numbers passing into Holland, Germany, and France. Not uncommon in England, especially the midland and southern counties, frequenting low fenny districts. Feeds on aquatic vegetables, Snails, &c. Its flesh is said to be finely-flavoured and tender. Mr. Gould is not aware whether the black markings on the breast are only assumed during summer, or whether they are confined to certain individuals. We think it probable that they are never found in young birds.

White Pelican, *Pelecanus onocrotalus*—Pélican blanc, *Fr.*—Pelicano onocrotalo, *It.*—Grosser Pelekan, *G.* An adult male is well-figured, one-third of the natural size. "Strictly confined to the old world, over a great portion of which it is plentifully distributed." Temminck states that the bird found in Europe and South Africa is the present species. Feeds on fish, which it catches with extreme agility, notwithstanding the cumbrous appearance of its bill. It is unable to dive, and therefore frequents shallow water. Builds on the ground, constructing the nest, about a foot and a half in diameter, of coarse herbage, lined with soft grass; lays two or more white eggs. The pouch under the bill can be contracted or extended at pleasure. The first year's plumage is wholly brown, the complete adult attire—white, with rosy tints—not being acquired till the fifth or sixth year, from which we infer that the bird is long-lived.

Razorbill Auk, *Alca torda*—Pingouin macroptère, *Fr.*—Tord Alk, *G.* An adult and a young bird are figured, of the size of life.

The plate is remarkably pleasing. "Generally distributed throughout the seas of the arctic circle, never extending its migrations beyond the temperate latitudes of Europe in the old world, and the southern portions of the United States in the new. Inhabits the wide expanse of the ocean, the severities of which it braves with indifference; indeed, it appears to rejoice in the agitation of the billows, that bring around it multitudes of small fish, which constitute its only support." Lays a single egg on the barren ledges of rocks. In winter adults lose the dusky colour on the throat, and the old and young birds, at that season, closely resemble each other. The sexes offer no external difference.

Little Nightling, *Noctua nudipes*, Gould—Chouette chevêche, *Fr.*—Civetta gialla, *It.*—Kleiner Kauz, *G.* This bird is not the *Strix passerina* of Linnæus, although modern authors have termed it *Noctua passerina*, and therefore we are glad to find Mr. Gould has restored Nilsson's designation, *nudipes*. The plate represents an adult, natural size, very well. Abundant over nearly the whole of temperate Europe, but only a straggler with us. Preys, in the evening, on Mice, Moles, small birds, and large insects. The eggs, four or five, are deposited sometimes in trees, but more commonly in old walls and ruined towers. The sexes and young are similar.

Bernacle Goose, *Anser leucopsis*—Oie bernache, *Fr.*—Weisswangige Gans, *G.* Common in Holland, France, and Germany, and, in winter, on the whole of the western coast of Britain and the north of Ireland, frequenting marshy localities. Feeds on vegetables, seeds, and grain. "Breeds in the regions of the arctic circle, but we have no correct information as to its eggs or its peculiar habits of nidification, in which, however, we conceive it agrees with its congeners." The sexes are similar, but young birds have the face more clouded with black. Mr. Gould's figure of an adult, three-fourths of the size of life, is as good as we could desire.

TWO CHAPTERS, ILLUSTRATIVE OF THE CHARACTER AND CONDUCT OF JAMES I.

"It is scarce hyperbolic to say, that this prince has been the original cause of a series of misfortunes to this nation, as deplorable as a lasting infection in our air, our water, or our earth would have been."—*BOLINGBROKE'S Dissert. upon Parties.*

"Maximus in folio, minimus in solio."

"The reading of histories may dispose a man to satire; but the science of history studied in the light of philosophy, as the great drama of an ever unfolding Providence, has a very different effect."—*COLERIDGE, On the Church and State.*

ON a fly-leaf in the octavo edition of Bevil Higgons's works, deposited in the British Museum, a late distinguished president of the Royal Society, Sir Joseph Banks, has thus expressed himself:—"In contemplating his character, which seems eccentric, his style is, in my opinion, though unequal, the most distinct and easy to comprehend in his best passages that I recollect ever to have met with."* That this author should have been so praised by any moderately competent appreciator of a felicitous selection of expressions—by any one who pretends to have paid the least critical attention to those qualities of style which put the reader at once into possession of the whole sense, is to us as startling a thing as if we had found a defence of popery among the writings of John Knox, or from the pen of John Wesley a eulogy of calvinism: for he who will be at the trouble of comparing a few pages of Higgons with our writers admired for perspicuity of style, must presently discover that a most undeserved compliment has been paid to him, since "he draweth out the thread of his verbosity finer than the staple of his argument." At first sight, it would seem to be a paradox that the fame of Higgons should stand so high among our foreign literati, that translations, we are told, of his *Historical and Critical Remarks on Bishop Burnett's*† "*History of his own*

* This note is addressed to Sir William Musgrave.

† Of this fierce opponent of the bishop, who so perseveringly flourishes his metaphorical sword the pen against him, we know but little, and that little is not calculated to excite the reader's respect. In the *Biographie Universelle*,

Time" have lately appeared in German and Italian. But "we would entertain the conjecture" that this never would have happened, if Higgons had not been the devoted champion of those political vitalities which are still warmly fostered in the bosom of many an absolutist on the continent, "with whom the original taint transmitted down from King James the First remains still in the full strength of its malignity."*

To be duly qualified for his censorian task, Higgons should have been possessed of a great fund of historical knowledge, conjoined with a discriminating judgment. In both these requisites he is strikingly deficient. There may be shrewdness in some of his observations, and the truth of the inference he has drawn from some insulated facts is, perhaps, not to be questioned. Yet no impartial man can look into his pages without perceiving that, under the semblance of truth, he is an artful bigotted partizan, and one who acts the sophist rather than the fair enquirer; so that a person would no more be able, by perusing his volume, to form a correct estimate of the *History of his own Time*, than he would of the meridian splendour of the sun by seeing it under an eclipse. We reiterate our opinion, then, that his strictures would have been consigned to the land of forgetfulness, if he had not been more eager to excite or aid the ambition of despotic power, than to damp and discourage it. And because, in Burnett's account of James, there is not that blindness to the manifestation of truth and duty which would entirely overlook his most palpable acts of mis-government—his most glaring iniquities and errors—the bishop is arraigned by Higgons in a strain of vituperation suited only to the abettors or zealots of the grossest corruption. An impartial recital of facts thus assumes in the eyes of this most malignant of traducers the aspect of an invective. We shall, however, bring a supplementary set of them to show—and facts, according to the proverb, "are stubborn things"—that Burnett had no desire to throw a cloud of detraction over the imputed merits of James, but was more inclined

par une Société de gens de lettres à Paris, chez Micaud, 1817, we are informed that Higgons was born at Kelso in 1670, and early distinguished himself for his attachment to James II., whom he accompanied to Paris, and remained with him till his death in 1701. After this he returned to England, and to propitiate the government of William, he published "*The Generous Conqueror*." This political trimmer then became Professor of History at one of our Universities, and gave to the public, beside this tirade upon the History of his own Times, an abridgment of the *History of England*.

* See Bolingbroke's *Dissertation upon Parties*, vol. iii., p. 132.

to give his misdeeds a modified form, than to mark them with an honest and undaunted reprobation.

Now some writers, regarding the reign of James as one of the most disgraceful epochs in the English annals, have, with the best intentions, though certainly not with the best judgment, rapidly glanced over it, thinking that its transactions might be wisely sent to oblivion. But it has been well observed by Von Raumer that "the attractive period of the Rebellion is as little to be understood without an accurate knowledge of the history of James, as the French Revolution without a knowledge of the history of Louis XV."* Unquestionably the British king, with all his affected political sagacity, was not a "discerner of the signs of the times." He knew not that each age develops principles, the conception of which has been the work of a preceding age; and therefore he imagined not that by saying, and acting upon the conviction, that the prerogatives of the crown were an indefinite trust, and not held for the benefit of the governed, he was laying a mine whose explosion would rend into pieces the throne of his successor. What composed investigator of that forcible shock or movement the *Great Rebellion*, does not perceive that the fiery excesses of popular passions thereby called forth, are as much derivable from James's want of inferring, from an expansion of intellect among the ascendent classes of the community, a proportionate advancement in the love of civil and religious freedom, as from his actual faithlessness and misrule. A reign, therefore, so especially remarkable, by leading to those great struggles and changes which ended in the abolition of the regal name and power, and the prostration of the episcopate, inglorious as it may be in itself, must ever hold a prominent place in the philosophy of history.

We assert, then, without any qualification or restriction, that the national troubles of the seventeenth century are clearly traceable to certain speculative notions of James, upon unlimited regal power and upon the doctrine of passive obedience, which, however they might exist in books,† could never be brought into practical working without the fatal assumption of "the right divine to govern wrong." Surely his open and distinct declaration to

* See *History of the Sixteenth and Seventeenth Centuries*, illustrated by original documents, vol. ii. p. 191.

† In Cowell's singular work, entitled the *Interpreter of Words and Forms in Common and Statute Laws*, Lond. 1701. fol. we find descriptions of an English king which faithfully represent the feelings and doctrines of James on this particular point.

Beaumont, the French ambassador, that his master and he were "absolute monarchs, and in no respect dependent on the counsels or consent of their people,"* must have early led those who possessed elevated and energetic sentiments to ponder upon the conflicting duties of subjects and free men ; while, from his entering upon his high office with these fundamental principles upon the prerogative royal, "from his mistaking the weight for the strength of the sceptre," it is no wonder that, in a subsequent despatch, Beaumont should have expressed this deliberate and sagacious opinion upon the royal infatuation :—"I recognize so many seeds of unsoundness in England, so much is brewing in silence, and so many events appear to be inevitable, as to induce me to maintain that, for an hundred years to come, this kingdom will hardly misuse its prosperity to any other purpose than its own injury." But still, as so much scepticism† prevails, even in the present day, respecting the real character and conduct of James, we purpose here a lengthened discussion, the main object of which is, however, not controversy, but instruction.

One of Higgons's first furious diatribes is directed against Burnett, for presuming to say that James sent the pope a letter of reconciliation. There is plausibility enough in his endeavours to establish the point that the bishop has intentionally falsified history in advancing this charge ; but, luckily, available materials exist completely to vindicate the accuracy of our historian on the subject. Higgons's strictures are given in his most characteristic manner. He thus commences them :—"Not content to injure private persons, he judges with the same rashness of princes ; he first charges positively king James with writing a letter to the pope, and then comes off with a general belief of that matter."‡

Now it is a fact as notorious as any in our history, that James, with a view to secure his accession to the English throne, earnestly sought to engage in his interests those foreign powers who were most attached to the Romish see ; and for the furtherance of that

* See Von Raumer's *History of the XVI. and XVII. Cent.* p. 197—199.

† "In the course of study, and with a more enlarged comprehension of the age," says Mr. D'Israeli, "I was frequently struck by the contrast of his real with his apparent character, and I thought I had developed those hidden and involved causes which have so long influenced modern writers in ridiculing and vilifying this monarch." See an Enquiry into the literary and political character of James I. by the Author of the *Curiosities of Literature*, p. 7. London, 1816.

‡ *Remarks on Bishop Burnett*, p. 11.

object a letter, with his signature, had been sent to Clement VIII. Elizabeth had obtained some insight into this affair, but was deceived into a belief of her successor's innocence by his steadfast denials. Peculiarly circumstanced as James was, his motives for conciliating not only the pontiff, but the chief princes of Europe,* cannot but be obvious to the shallowest politician. If we are to place confidence in the letters of Cardinal d'Ossat, there was a settled plan formed by the popish princes, and which had the sanction of the pope, to exclude a heretic from the throne of England. The hostile spirit manifested by Henry the Fourth towards the succession of James, which arose from the belief that the union of the two crowns would advance England, in power and influence, above the chief continental states,† is well known. James also was apprized that cabals had been formed in support of the titles of the Lady Arabella Stuart‡ and the Earl of Hertford; nor was he unapprized of the intrigues carrying on in favour of the Infanta,|| the daughter of Philip II., who had given broad hints that, if the English would co-operate with him in wresting the sceptre from Elizabeth's hands, a free parliament should elect any Roman Catholic sovereign, not doubting that its choice, under such circumstances, would fall upon the Infanta, especially as he had also thrown out to the merchants the tempting lure of a free trade to the Indies.§ This affair, perhaps, would not have so much alarmed James, had he not been well

* See his instructions to his ambassadors in *Birch's Memoirs*, vol. ii., p. 510—514. Miss Aikin observes, "There was not a petty protestant prince allied to him by his marriage, to whom he did not deem it requisite to direct a solemn embassy for the purpose of explaining his right." See her very able work, *Memoirs of the Court of King James I.*, vol. i., p. 38.

† See Winwood's *Memorials of Affairs of State*, vol. i., p. 352.

‡ Mr. Townshend in his *Accusations of History against the Church of Rome*, is mistaken when he asserts that Arabella was a Romanist; predisposed no doubt she was to that party, but had never professed the Roman Catholic Religion. So late as 1610, she incurred "some suspicion of being collapsed." — *Winwood's Mem.*, vol. ii., p. 117.

|| The writings of Father Persons or Parsons the Jesuit, prove him a man of great talents, but his principles were detestible; for they sought to infuse a distrust of all power which did not lead to the establishment of the most complete Papal Despotism. In his celebrated work, entitled *Doleman's Conference on the next succession to the Crown of England*, he advocates most powerfully the claims of the Infanta, deriving her descent from John of Gaunt, and thus making her the right heir of Lancaster. Many a learned genealogist will admit that several of his proofs, premises and conclusions are founded upon weighty and sufficient reasons.

§ For this fact, see *Birch's Memoirs*, vol. ii., p. 308.

aware that he reigned over a people, at that time, hated by the English; and therefore, however averse they might be to the dominion of strangers, yet it was possible the national prepossession would run strongly against his pretensions. Another serious cause of apprehension was, that the will of Henry VIII., which had been ratified by act of parliament, seemed to exclude the Scottish line. For, after entailing the crown upon his own children, he settled it, in default of their issue, upon Frances Brandon, Marchioness of Dorset, and Eleanor, Countess of Cumberland, daughters of his younger sister, Mary. In failure of their posterity, it was to go to the next lawful heir, under which words must be implied the reigning family of Scotland, descended from Margaret, wife of James V., and eldest sister of Henry. As the descendants of Mary were living at the decease of Elizabeth, political asperities, personal animosities, and local dissensions, might have operated powerfully to prevent the scion of the house of Stuart from obtaining the sovereignty of England, had not sound policy determined that concord between the two kingdoms, and their ultimate consolidation, were most likely to be secured by the elevation of James to the British throne.* It is not wonderful, then, that, to countermine the machinations of Philip and his other Roman Catholic opponents, James

* Higgon's unqualified invective here against Burnett is not likely to have much weight with critics of sounder judgment and more candid dispositions, when they are reminded that the Bishop in his *History of the Reformation*, with a view to support the lawful claims of the House of Stuart, seems favourable in a high degree to the opinions of Secretary Lethington, the Bishop of Ross, and Sir James Craig, who deny the genuineness and authority of Henry's will. Assuming their reasoning to be correct on this point, still it is quite clear that James ascended the throne of England in direct contradiction to the order of succession appointed by several Acts of Parliament. In the Act, however, which recognised him, it is expressly said, such was then the servile state of feeling towards him on the part of the popular branch of the legislature, that "immediately on the dissolution and decease of Elizabeth, late Queen of England, the imperial crown of England did, by inherent birth-right and lawful and undoubted succession descend and come to the said King James." This bill for his recognition was read three times on the same day in the House of Commons. See the Journal of that House 1st Jacobi. His Majesty must have been highly flattered by this unprecedented compliment. It is not generally known, that for nearly twelve months after James's accession, the statutes then in force vested the legal right to the throne in Lord Seymour, eldest son of the Earl of Hereford, by Lady Catherine Grey (sister of Lady Jane Grey), as heir of Mary, Duchess of Suffolk, the youngest sister of Henry the Eighth.—For this curious fact, see Sir Harris Nicholas's *Literary Remains of Lady Jane Grey*, p. cxxvi—cxlviii., note.

should have secretly entered into a political union with the pope ; for though there was religious intolerance on both sides, yet that was not allowed to present a fatal obstacle to a good understanding between them, when they found their interests, in so many important respects, to be the same.

The following statement, however, of Burnett, has exposed him to a storm of invective from his reviewer:—"A letter* was also written to the pope, by him, giving assurance of this, which, when it came to be published, by Bellarmine, upon the prosecution of the recusants, after the discovery of the Gunpowder Plot, Balmerinock did affirm that he, out of zeal to the king's service, got his hand to it, having put it into a bundle of papers that were signed in course, without the king's knowing any thing of it. Yet when that discovery drew no other severity but the turning him out of office, and the passing a sentence condemning him to die for it, which was presently pardoned (and he was, after a short confinement, restored to his liberty), all men believed that the pretended confession of the secretary was only collusion to lay the jealousy of the king's favouring popery, which still hung on him, notwithstanding his writing on the Revelations,† and his affecting to enter, on all occasions, into controversy, asserting in his book that the pope was antichrist.‡ An evil concupiscence of theological controversy will ultimately involve the peace and respectability of the individual who indulges in it. If James, in one of his polemical treatises, had not said what

* *History of his own Time*, vol. i., p. 14. Oxford Edition.

† In reference to this composition, Boderie the French Ambassador says, that it was "le plus fou, s'il m'est loisible d'ainsi parler, et le plus pernicieux que se soit jamais fait sur tel sujet."—t. iv. p. 302. Scaliger remarks, that Calvin was wise, because he did not write upon the Revelation. "Calvinus sapuit, quia non scripsit in Apocalypsin." But it was the spirit of James to deem himself wiser than all the world besides, and therefore he so often made himself the laughing-stock of Europe. "La presumption seule," says Boderie, "qu'il à de sçavoir plus en théologie que tous les docteurs du monde, en est l'unique cause." Ibid iv. p. 319. A young Prince, for James had not then attained his twentieth year, writing a Latin commentary on the Apocalypse, was an undertaking so preposterously strange and even ludicrous, that we might almost anticipate the reply of his illustrious tutor Buchanan when reproached for making his Sovereign a *pedant*—"that it was the best he could make of him."

‡ In his eager desire to purify the theology of Rome, lest his own should be brought under a suspicion of orthodoxy, he thought it proper to soften down his interpretation by saying, that the Pope was Antichrist only while he clothed himself with temporal authority in other states, besides his own.

offended that formidable champion of the Roman Catholic cause, Bellarmine, his letter to the pope would, in all probability, have been forgotten; but, under the name of Matthæus Tortus, the exasperated cardinal published it, and, further to annoy his royal antagonist, accused him of abandoning the good policy of toleration which he had professed to Clement VIII., and of disappointing the hopes which he had held out of speedily relinquishing the protestant religion. Sir Ralph Winwood positively asserts that, in the year 1596, James despatched a Scottish baron of the name of Ogilvie to Spain, to assure his catholic majesty he was then ready to turn papist, and to propose an alliance with that king and the pope against the queen of England; but, for reasons of state, the affair, he adds, was hushed up.* Elizabeth must have found it difficult to stifle her suspicions of his vacillating spirit in his religious creed, when she enjoins Sir Richard Wiggmore, among other topics of instruction, to "induce the king resolutely to profess himself a protestant,† and to rely and depend upon the amitie of Queen Elizabeth and England, rather than that of any other potentate."

To make a safe passage through the perils of this direct and unexpected attack—to get rid of the high moral and political misdemeanour of a protestant monarch carrying on a correspondence with him, who was then deemed the very personification of the Anti-christ, the Man of Sin—and in that correspondence not only soliciting the dignity of cardinal for a Scottish papist, Drummond, Bishop of Vaison, but even subscribing himself "*Beatitudinis vestræ obsequentiſſimus filius*,‡ J. R."—the king had no alternative but that of throwing the odium of the letter upon his secretary, Elphinston,

* See Winwood, vol. iii., p. 55, 56.

† "It appears," says Burnett, "that Walsingham thought that the king was either inclined to turn Papist, or to be of no religion." *Hist. of his own Time*, vol. i. p. 13.

‡ See Rushworth's *Hist. Collec.* vol. 1, p. 166. And yet we have him afterwards parading forth his consistency of religious belief to Buckingham, who had no religion at all, telling him, "I am not a Monsieur who can shift his religion as easily as he can shift his shirt when he cometh from Tennis." See Hardwick's *State Papers*, vol. i., p. 412. To the same effect did his son afterwards express himself. And yet he too wrote a letter to the Pope, which so scandalized the protestantism of Clarendon, that he openly hints his feelings of dissatisfaction at it to his confidential friend, Secretary Nicholas. "The letter to the Pope is by your favour more than complimentary, and may be a warning that nothing is to be said or done in that nice argument but what will bear the light." See Clarendon's *State Papers*, vol. ii., p. 337.

afterwards created Lord Balmerino, who confessed, *as it is said*, that James affixed his name to this paper, among other official instruments, without any knowledge of its contents. If we enquire a little further into the history of this curious transaction, it will appear evident to those who like to have things reported just as they are,* that James had acted towards Balmerino as Elizabeth did towards her under secretary, Davison, respecting the despatch of the warrant for the execution of Queen Mary.† Now, Clement's former assurances to James, that, as the son of his virtuous mother, he had prayed for his temporal and eternal welfare, and his ordering public thanksgivings and processions at Rome to celebrate his accession, are circumstances which assuredly will not be thought to form exceptions to the tenor of the above remarks, since they must produce a strong impression of James's early leaning to popery, independently of the grand fact that his very first speech in parliament, according to a remark of that keen observer, Professor Heeren, "declares in such plain words that catholicism (excepting the doctrine of the papal supremacy, which was detestable to him from its limiting the regal power), was the religion of his heart, that it could not but destroy once and for ever the confidence of the nation in their king.‡"

There would seem no room for doubt, in the judgment of Sir John Scott, that Balmerino was the person selected to rescue the king from his hapless predicament: for this writer roundly asserts the entire knowledge and direction of James in this affair. "Balmerino," says he, "was in such favour with King James, that he craved the reversion of Secretary Cecil's place at the king's coming to the crown of England, which was the beginning of his overthrow; for the said Secretary Cecil wrought so, that he procured a letter which had come from King James, wherein he promised all kindness to the Roman see and pope if his holiness would assist him to attain to the crown of England. This letter the said Secretary Cecil shewed in the king's presence in the council of England; whereupon King James, fearing to displease the English nation, behoved to disclaim the penning of this letter, and lay the blame thereof on his secretary, whom, a little before that, he had made Lord Balmerino, to whom he wrote to come to

* See Caldewood's printed *History*, 426, 427, 604. Howell's *State Trials*, and *Ambassade de M. de la Boderie*, t. iv., p. 66.

† For her treachery and hypocrisy in this whole affair see *Life of Davison*, by Sir Nicholas Nicolas, p. 14, and art. Davison, *Biog. Brit.*

‡ See *Historical Treatises*, from the German of A. H. L. Heeren, p. 232.

court, where being come, for exoneration of the king, he behoved to take upon him the guilt of writing that letter.* It is also asserted by Balfour, that he (Balmerino), confessed similtatly, as was thought by thesse, that he wnderstood the courte, and how matters then went, to liberat the king of such grossness."† Let us now hear the declaration of the ill-treated secretary himself:—"Next followed my conviction in St. Andrew's, wherein I was the only actor myself, to give his majesty satisfaction, following in every point the Earl of Dunbar's direction, brought to me by my Lord Burley or the Lord Scone."‡ If suspicions still remain that James was a stranger to this letter, these additional remarks may be thrown out, to put an end to every doubt:—That Lord Home, who was himself a papist,|| had been entrusted with a secret commission to the pope; that the king, in his reply to the cardinal, as carefully avoids all allusion to the letter of Balmerino or his confession as he would the bite of a Rattlesnake; and that, after this unfortunate secretary had been convicted of treason, and had undergone a slight imprisonment, his sentence, as stated by Burnett, was remitted, and he was restored alike to his estate and blood.§ These facts are a volume of argument.

In the following passage, Higgon's affirms that Burnett's words mean to convey the infamous insinuation that James was the author of his son's death. His object, however, was simply to state that Prince Henry died by poison, according to his belief, and that Somerset, the king's unworthy favourite, had caused it to be administered to him:—"Prince Henry was a prince of great hopes, but so little like his father that he was rather feared than loved by him. Whether his aversion to popery hastened his death or not I cannot tell. Colonel Titus assured me, that he had from King Charles the First's own mouth, that he was well assured that he was poisoned by the Earl of Somerset's means."** In the first assertion, Burnett is supported by the most satisfactory authority, since, both

* See the *Staggering State of the Scots Statesmen*, by Sir John Scott, p. 60.

† See *General Hist. of Scotland*, vol. II., p. 29.

‡ Caldewood, p. 600, 604, 605.

|| Winwood's *Mem.*, vol. xi., p. 57.

§ "Balmenoche deyed of a fever and waikness in his stomache some few monthes after the death of his arch enimey and competitor Cicill Earle of Salisburney (after quhom if aney tyme he had survived as well talked by them that best knew the Kynys mynd) he had beine in grater crydit with his master than ever." Balfours MSS. as quoted by Guthrie, vol. ix., p. 53, 56.

** *History of his own Time*, vol. I., p. 18, 19.

at home and abroad, the prince's death was considered as a great national loss ;* but so little did the king seem to be affected by it, that, after a short interval, all persons were forbidden to appear before him in mourning ; and special directions were also issued that the preparations for the Christmas festivities should meet with no interruption—while, three days after Henry's demise, Rochester had orders to direct Sir Thomas Edmonds, at Paris, to open overtures for a marriage between Prince Charles and Christine, the second daughter of the late King of France ; but a sense of decency and a sense of general reproach prevented the ambassador from complying immediately with these instructions.

The following letter of the Earl of Dorset to the same ambassador is particularly deserving of remark :—" That our rising sun is set, ere scarcely he had shone, and that with him all our glory lies buried, you know and do lament as well as we ; and better than some do, and more truly, or else you are not a man and sensible of

* Few eyes were dry, few hearts untouched, if we are to believe the Secretary of Sir Thomas Edmonds, at the loss " of the flower of the house, the glory of his country, and the admiration of all strangers, which in all places had imprinted a great hope in the minds of the well affected, as it has already stricken terror into the hearts of his enemies." So writes M. Bulieu to Mr. Trumbolt, then President at Brussels. The Universities lamented the Prince in sermons and Latin orations. Chapman, Webster, Heywood, Withers, Maxwell, and other poets of his day, sang his praises. One, however, of the tribe, was silent on the occasion—" the rare Ben Jonson." A circumstance which will contribute to justify the general belief, that James was more willing that *England's darling*, as the Prince was styled, should be decried than extolled ; for though Jonson was not appointed Laureate, yet he was the Court Minstrel. The following strains for extravagant conceptions out-top all that we have met with in poetic commendation of Henry.

" See where he shineth yonder
A fixed Star in Heaven
Whose motion here came under
None of the planet's seven.
If that the Moone should tender
The Sun her love and marry,
They both could not engender
So sweet a Star as Harry."

Verses written upon Prince Henry's death by Hugh Holland, Fellow of Trinity College, Cambridge, apud Laud, M. S. For the same prodigal use of laudatory superlatives in prose, see a Funeral Oration entitled "*Lacrymas Tumulo nunquamsatis laudatis Heroes Henrici Frederici Stuarti a Guallero Deraldsono Sooto.*" Brit. Sedani, 1613.

this kingdom's loss."* Sir Robert Naunton, the avowed partizan of Rochester, likewise clearly demonstrates that all was not right between the father and son; for these are some of the mysterious sentences of that secretary of state in his letter to Winwood:—"Touching our palladium which we have lost, I hold it neither fit to write what I conceive, and less fit to be written to your lordship. It is given out by his confidant, that he had a design to have come over with the palsgrave, and have drawn Count Maurice along with him with some promises, and done some exploit upon the place which shot the palsgrave's harbinger, and happily to have seen the landgrave's daughter, or I know not what. That this he meant to have done, whatsoever it was, '*clam patrem et senatum suum*,' unknown to his father and the council, and hatching some such secret design, which was made subject to misconstruction, it is now become abortive, like that of Henry IV. of France."† None of the cordialities of affection existed between Henry and James, as may be easily collected from the angry manner in which the proceedings of the latter were arraigned by his immediate heir. For thirteen years Sir Walter Raleigh had been shut up a prisoner in the tower by order of the king; "and what other king," was the indignant exclamation of the prince, "would have shut up such a bird in a cage."‡ Upon other occasions, Henry pertinaciously differed from his father, finding many practices in the conduct of affairs which he would not approve, and some of which he could not forbear to oppose.¶ Tutored, also, by his mother, the prince openly ridiculed the follies and weaknesses of James, which, joined with his high daring, his warlike propensities,§ his hatred of popery,** and his desire to reform the Reformation itself,†† were all so many estrangements from paternal love.

* See Birch's *Life of Prince Henry*, p. 405.

† Winwood, vol. iii., p. 410, &c.

‡ See Coke's *Detection*, p. 37.

¶ See Carte's *History of England*, vol. iii., p. 747, and Birch's *Life of Prince Henry*, p. 405.

§ In a letter which Henry addressed to the Prince de Joinville, he observes that he had sent him a present of the two things he loved best, arms and horses, and when asked by the French Ambassador if he had any message for his royal master, the reply was, "Tell him what I am now doing, tossing the pike." Birch's *Life of Prince Henry*, p. 75.

** In the plenitude of his Protestant zeal, we are told by Sir Henry Nevil, he had vowed that never idolatry should come in his bed, and that he considered his sickness as a deserved punishment upon him, for having opened his ears to admit the treaty of a Popish match. Winwood, vol. iii., p. 416.

†† His Governor, Sir Thomas Chaloner, was supposed to be a great favo-

"When the expectancy and rose of this fair state expired," the feeling gradually stole upon the people, and at last came to be audibly expressed, that he was cut off by the arts of Somerset.* That great light of the law, Coke, even proceeded to throw out this significant hint whilst presiding at the trial of the favourite:—"God knows what went with the good Prince Henry, but I have heard something." From such a man, a suspicion of this kind was almost a sentence or judgment. We are not, therefore, to be surprised that the impression became so prevalent, not only among the people, but among many of high station, that the prince had fallen a victim to the treachery of Somerset; and as James had many more enemies than admirers, even his reputation was not spared in their conjectures.† It is no reproach, then, to Burnett, to have said that which

rite of the *Puritans*. But he wanted neither ability nor moral courage to discharge his duties ably as well as honestly to the Prince. "All parties placed great confidence in him." See *Short Account of Sir T. Chaloner*, Governor to Prince Henry, p. 3. He had a great turn for Natural History and Chemistry. The alum works at Gisborough which were established by him, show that his scientific researches were productive of real utility. Harrington, in reference to the prince's supposed leaning to the church views of Knox and Calvin, says in his *Nuga Antiqua*, vol. iii, p. 3, that this couplet was common with the people:—

"Henry the Eighth pulled down the abbeyes and cells
But Henry the Ninth shall pull down bishops and bells."

* The depth of infamy into which that minister had sunk, may be estimated from the queen's venturing on the extravagant monstrous charge, that he intended to poison her, Prince Charles, and the elector palatine, in order to marry the electress to Lord Suffolk's eldest son. See Carte's *History of England*, vol. iv., p. 33. This circumstance also, it was said, made great impression upon her mind, that when Raleigh was applied to for a much talked of prescription of his, during the last illness of the king, he sent it with this message, "that it would certainly cure him or any other of a fever *except in a case of poison*." See Welwood's *Notes on Wilson*, vol. ii., p. 714. It is worthy of remark, that a far more renowned Prince had recourse to this medicine just before his decease, and that it served to prolong his existence for a short time. "Yesterday morning his majesty (King William the Third) expired in the arms of Mr. Sewell, one of the pages of the back stairs. He had been kept alive for five or six hours merely by the help of *Sir Walter Raleigh's cordial*, and was sensible to the last." See a particular relation of the sickness and death of his last Majesty, &c. London, 1702, p. 14.

† When Whitelocke repaired to Sweden as the English Ambassador, Christine spoke of Prince Henry's death in that way, as if she inferred a judgment upon the House of Stuart for it. See *Embass. Ays. MSS.*, No. 49, p. 206.

all mouths, at the same time, were open to declare. But though his implied suspicions were made less invidious by the corroborative misgivings of many others, yet it must be admitted that he has here overlooked the important distinction between the truth of opinion and the truth of fact. What Hume has remarked on this subject appears to be founded on such sentiments as both nature and reason must approve. "If Somerset," he sagaciously asks, "was so great a novice in this detestable act that, during the course of five months, a man who was his prisoner, and attended by none but his emissaries, could not be despatched but in so bungling a manner, how could it be imagined that a young prince, living in his own court, surrounded by his own friends and domestics, could be exposed to Somerset's attempts, and be taken off by so subtle a poison, if such an one exists, as could elude the skill of the most experienced physicians?"* The only thing, indeed, which can furnish any plausible pretext for the idea that Henry was poisoned by the minion of the king, is to be found in the following story related by Sir Charles Cornwallis, treasurer to the prince, and is to this purpose: That Rochester had addressed a letter to the prince, in which he had signed himself "yours before all the world." Henry directed Cornwallis to reply to this epistle, but, perceiving, when he was about to fix his signature to it, that his treasurer had concluded in a very complimentary form, he ordered the whole letter to be re-composed, declaring that Rochester (for though he does not actually name him, yet it is beyond all question the reference is made to him only) had dealt with him unfaithfully and falsely, and that his hand should never attest what his heart did not dictate. In opposition, however, to these surmises, and others that are discoverable in the secret histories or memoirs of the time, respecting the death of this prince, there exists the most positive and authentic evidence, collected from the journal of his last sickness, and from the reports of the surgeons who opened his body, that he died of a malignant fever,† a disorder which probably would not have been fatal, had the

* *History of England*, vol. vi., p. 71.

† It is singular that Mr. Fox, if he had perused the discourse of Sir Charles Cornwallis on the life and death of Prince Henry, which contains a minute detail of all the symptoms of the prince's case, extracts from which may be found in Birch's Life, should have stated it as his opinion that he was poisoned. See letter from him to Lord Lauderdale in the preface to his *History* by Lord Holland. A high authority, the French ambassador, Spifame, in one of his dispatches to the Minister Puyseux says speaking on this subject, "I hold the death of Prince Henry to have been natural." Raumer *History of the XVI. and XVII. Cent.*, vol. ii., p. 222.

science of medicine, in those days, been sufficiently advanced to have treated fevers by cold affusion;* instead of which, "Sir Theodore Mayerne, a French physician, and in great esteem, would have let blood." These continual bleedings, therefore, destroyed a prince "whose sun went down while it was yet day."

Higgon's again grossly calumniates the bishop in the following sentence:—"I should not have laid so much stress on this matter if the author had been speaking of any other person but King James, against whom he had so inveterate a malice, as is evident by the barbarous, unjust character which he gives of that prince."† But if this were the deep and abiding feeling in the mind of the bishop, we must find it altogether impossible to reconcile ourselves, among other remarkable omissions in support of James's reputation, to his silence respecting the prosecution of Peacham, a clergyman in Somersetshire, which, above all this king's iniquitous acts, breathes the odious principles of pure, unmingled despotism. Here was the happiest opportunity presented to our historian of showing, what sounds like a monstrous and shocking exaggeration, that the British Solomon had a heart as weak as it was obdurate and wicked. A more wily tactic could not have been attributed to the most eulogistic biographer of "the pedant reign,"‡ than to have treated that

* See Dr. Currie's *Medical Reports on the effects of Water, cold and warm, as a remedy in Fever*; a performance which is strikingly indicative of the general ability of this eminent man in his profession.

† *Remarks*, p. 23.

‡ Bolingbroke has justly observed, "that his pedantry was too much even for the age in which he lived," and perhaps it would have been almost found repugnant *Academice Disciplinæ*. Lord Dartmouth on the information of the Earl of Mar thinks proper to assert, "that King James's pedantic education was designedly given him to make him contemptible both at home and abroad." Notes upon Burnett's *History of his own Time*, vol. i., p. 12. But this opinion does not harmonize with our convictions. It was one of the chief concerns of the Scottish state to provide suitable preceptors for their future monarch. Under that highly gifted man, George Buchanan, the young king was instructed in the liberal studies, rhetoric, logic, history, particularly modern history; also in the learned languages, and in geography and astronomy. Moreover, to inspire his royal pupil with views and sentiments fitted for his exalted station, and to enable him to play a higher part than "the wisest fool in Europe," as he was styled by Sully, Buchanan endeavoured with emphatic enforcement to make history one continued comment and exemplification of this now acknowledged principle, that princes govern not for their own advantage, but for that of their people. See his famous treatise *De Jure Regni apud Scotos*. If there had been, then, the disgraceful project to dwarf the intellectual growth of James, to stunt his energies, to disable his understanding, Buchanan could never be fairly accused of becom-

worst of his proceedings, as Burnett has done, as matter exciting no attention, and therefore to be passed over as never to be known ; whereas, from the publicity and interest given to Peacham's case, in consequence of the Chief Justice Coke's dispute with the king and Bacon, then attorney-general, respecting extrajudicial questions to the judges, he must have felt that he was swerving from the line drawn by historical justice, in not presenting his readers with a full and fair account of this abominable transaction. A manuscript sermon had been found in the study of Peacham, which he had not preached, and which, we learn from Judge Coke, he had never intended to preach. In this discourse he complained of the king's expenses ; of his keeping divided courts for himself, his queen, and his son ; of his gifts for dances, feastings, and maskings ; and of the frauds of his officers. For these censures, which, had they been published, might have amounted to a seditious libel, the puritan minister was tried for high treason, under the statute of Edward III. The old man—for he was above sixty—was put to the rack, and examined upon various questions, says Winwood, then secretary of state, *before the torture, under the torture, between the torture, and after the torture*, by express command of "the mild and gentle prince," for so he is styled by Sir Symonds d'Ewes, in his *Diary*. Yet Mr. D'Israeli, departing from his usual acuteness and love of historical truth, tells us that "he exercised his power without an atom of brutal despotism adhering to it."*

Now, aware, that any attempt to convert the overt act of writing a libel into compassing the king's death would be to flounder in absurdity, but determined to wreak his vengeance on the prisoner, James directed Bacon to procure the opinions of the judges, *separate and apart*, previously to the trial, and for the direct purpose of influencing their decision in behalf of the crown. With this unconstitutional command Bacon had the baseness to comply.

ing partioeps criminis, however true it might be that the benefit of his instructions was defeated by James's sub-tutor, Young. Subtle, insinuating, penetrating, and tinctured with all that pedantic learning so much affected afterwards by James, this bad man soon found out that his young sovereign loved those only who were accustomed to humour and flatter him. Accordingly he connived at all his faults, paid a blind servile obedience to all his whims and wishes, and injured the best interests of his country by secretly cherishing in James that love of absolute monarchy which ultimately proved the destruction of his race. See Sibbaldi's *Comment. in Vitam G. Buchanan*, p. 20. Irving's *Memoirs of Buchanan*, p. 160, and M'Cries's *Life of Melville*, second edition, vol. i, p. 251—257.

* See *Inquiry into the Literary and Political Character of James I.*, p. 128.

The profligate logic employed by this master of official responsibility in the following letter to the king, and his disgusting indifference to every principle of our free constitution, require all our reverence for his great name to keep us, in this instance, from execrating it. "Truly by this time the English law would have been made a tradition," if there had not been a Coke to stand forth in defence of it. "We did first find an encounter in the opinion of my Lord Coke, who seemed to affirm that such particular, and, as he called it, auricular, taking of opinions, was not according to the custom of this realm; and seemed to divine that his brethren would never do it. But when I replied that it was our duty to pursue your majesty's directions, and it were not amiss for his lordship to leave his brethren to their own answers, it was so concluded; and his lordship did desire that I might confer with himself, and Mr. Serjeant Montague was named to speak with Mr. Justice Crook, Mr. Serjeant Crewe with Justice Houghton, and Mr. Solicitor with Justice Doddridge. This done, I took my fellows aside, and advised that they should presently speak with the three judges before they could speak with my Lord Coke, for doubt of infusion; and that they should not, in any case, make any doubt to the judges, as if they mistrusted they would not deliver any opinion apart, but speak resolutely to them, and only make their coming to be to know what time they would appoint to be attended with the papers. He [Coke] moreover said, which I noted well, that his brethren were wise men, and that they might make a show as if they would give an opinion as was required, but the end would be that it would come to this, they would say that they doubted of it; and so, pray, advise with the rest. But to this I answered that I was sorry to hear him say so much, lest, if it came to pass, some that loved him not might make a construction that that which he had foretold he had wrought."*

We must observe with concern, that the practice of converting the judges into counsel for the crown, so detrimental to the free uninfluenced and independent judgment of these high legal functionaries, was not the point against which Coke remonstrated: but it was the experiment of innovation in consulting them apart and in private, which produced his murmurings and complaints. And

* Upon Peacham's frightful case, and the legal discussions it originated, consult Lord Bacon's Works, vol. v., p. 336, Dalrymple's *Memorials and Letters relating to the Reign of James I.*, vol. i., p. 62, 64, and Howell's *State Trials*, vol. xi., p. 870, 877.

yet James, who was here so intent in degrading the judges into the abject characters of the mere instruments of the crown, could, in a speech to his parliament in 1601, assert in the most unequivocal terms—and the assertion was highly just and proper—that “the doing any act that may procure less reverence to the judges, cannot but breed a looseness in the government and a disgrace to the whole nation.” Surely, if James had not flattered himself that he had succeeded in his design of reducing the people at large, as well as the judges, into so complete a servitude that they had ceased to perceive the distinction between despotism and monarchy, he would not have ventured to utter such a public declaration as the above, and then, in the face of it, to insist upon the judges doing those acts whereby the law of the land was grievously infringed. But, that he never sincerely contemplated to render the judges anything but obsequious tools in their official capacities, may be clearly inferred from his employing the common law judges in acts of prerogative; upon which Lord Clarendon has pronounced the following manly and unanswerable sentence of reprobation:—“The damage and mischief cannot be expressed,” says he, “that the crown and state sustained by the deserved reproach and infamy that attended the judges, by being made use of in acts of power:” and in the next page of his immortal work, he observes:—“In the wisdom of former times, when the prerogative went highest, never any court of law, seldom any judge or lawyer of reputation, was called upon to assist in an act of power. The crown, well knowing the moment of keeping those the objects of reverence and veneration with the people, and that though it might sometimes make sallies upon them by the prerogative, yet the law would keep the people from any invasion of it, and that the king could never suffer whilst the law and the judges were looked upon by the subject as the asylum for their liberties and security.”*

Now, if it were so notorious that Burnett had passionately pledged himself to aggravate the royal failings, as he is charged by Higgins, whenever he speaks of James, would he have been content to omit the above-mentioned striking instances of scandalous and intolerable abuse of kingly power, which, when we calmly and impartially consider, must be regarded with a shuddering sense of abhorrence? What else, too, could be demanded in the most thorough-paced and unprincipled partizan of the degenerate monarch of Whitehall, than to drop all pointed reference to his systematic at-

* *History of the Rebellion*, vol. i., p. 124, 125, Oxford Edition.

tempts to controul and subvert the law, which would have our constitution, as the dying Brutus said of virtue, an empty name—to his forced loans and benevolences*—to his numerous oaths† and profane allusions—to his attachment to the cock-pit‡—to his deep potations at the table||—to his indecent carresses of his minions§—to his womanish** fears and credulity††—to his low curiosity‡‡—to

* To take a single instance, "The Benevolence goes on. A merchant of London had been a cheesemonger, but now rich, was sent for by the Council and required to give the king £200 or to go into the Palatinate and serve the army with cheese, being a man of *eighty years of age*." See Ellis's *Original Letter*. Second series, vol. iii., p. 240.

† So notorious were his habits of cursing and swearing, that even the players made them the subject of comment on the stage.—Boderie, tom. iii., p. 190, 197. The consequence was, that they were for a time expelled the capital.—Winwood, vol. ii., p. 54.

‡ "Il vit combattre les coqs, qui est un plaisir qu'il prend deux fois la semaine.—Boderie, t. i., p. 156.

|| In the entertainment given by Cecil at Theobald's when Christian IV. of Denmark visited this country, his Britannic Majesty was so inebriated, "that when he got up and would dance with the queen of Sheba, he fell down and humbled himself before her, and was carried to an inner chamber, and laid on a bed of state."—See Harrington's description of this disgusting scene, *Nugæ Antiq.*, vol. i. p. 348, &c. His wet nurse was a drunkard. *Nutricem unam habuit ebriosam*, so says Sir Theodore Mayerne, *Memoranda of King James*, M.S., Sloane, 1679. This, with some, will constitute an apology for his indulgence in this vulgar vice.

§ Upon this most disgusting subject, see Harrington, Weldon, Osborne, and Raumer's *History of XVI. and XVII. Cent.*, vol. ii., p. 261, 266, and this short but decisive note of his noble Translator.—"It is difficult to read the passage without deriving the worst opinion of his habits and those of his favourites."

** The following instance of pusillanimity is perfectly ludicrous. "The gentlemen of Grayes Inne to make an end of Christmas on Twelfth night, in the dead time of the night, shott off all the chambers they had borrowed from the Tower, being as many as filled four carts. The king awaked with the noise, started out of his bed, and cried out treason, treason, &c., and that the cittie was in an uprore, in such sort (as is told), that the whole Court was raised and almost in armes, the Earle of Arundell running to the bed chamber with his sword drawn as to rescue the king's person. These are such things as I heard from Londoners, and so I leave them. Yours to commande, Joseph Meade."—See Ellis's *Original Letters*, vol. iii., p. 119.

†† "By the Demonologia" and "Counter-blast," observes Grainger, James lost as much reputation as he had gained by his Basilicon Doron. One of the first of his English statutes was an extension of the penalties against crimes of sorcery and witchcraft. "The arguments of tyranny," says Burke, "are as contemptible as its force is dreadful." It constitutes a spectacle equally absurd and horrible, that above an hundred persons should have fallen victims to the superstition of James.

‡‡ Nursery secrets as well as state ones were equally committed to the

his familiar correspondence with Buckingham,* which, upon most occasions, was so loose and full of gross buffoonery, as more fitted a jester or mountebank than the successor of the great Elizabeth—and to a court which was a general agglomerate of all licentiousness †† Upon these several subjects, mostly of moral antipathy and rebuke, Burnett manifests either a shyness in speaking, as if he were stepping out of his province by so doing, or a heartless assent, in the place of godly intrepidity of censure. One might have reasonably imagined that each and all of these striking facts would have disgusted him excessively; so that he could not have even glanced at them without the true sparks of indignation “kindling as he ran.” To affirm, then, that he ever yields to the suggestions of malice at the mention of James—that he is here ready deliberately to sacrifice truth, honesty, and candour at the shrine of his dislikes and malignities—is to give as unfair a representation of our historian, as the artist would of his personal appearance who should represent him as a negro with a black face and woolly hair.

But if the cloven foot of malice were so unblushingly apparent, why, also, has Burnett omitted some important historical materials, which would further demonstrate the justice of his opinions on the

ears of this inquisitive king. See the ridiculous letter of the Duchess of Buckingham to him concerning “the weaning of Mall.”—*Dalrymple's Letters, &c.*, vol. i., p. 179.

* This sovereign of the sovereign whom Sir Edward Coke blasphemously called our Saviour, says Clarendon, could not have paraded with all his irreligion, the utterance of so many blasphemies in his correspondence with James, if he had not been pretty certain that his epistolary effusions, without being seasoned with a touch of them, would have been dull and tasteless to the royal palate. Why a man in these days would be hooted down for a fool or atheist even in the purlieus of St. Giles, if he were to express himself in the manner in which Buckingham did to James respecting the Father, Son and Holy Ghost, and the fruits of Paradise.—See *Hardwick Papers*, vol. i., p. 464, 468. In the dispatches of Count Tilliers, the French Ambassador in London, whose general representations of the Court affairs do great credit to his acuteness and accuracy, the “fiery Duke” is thus alluded to. “His will and pleasure pass for statute and prescription, and in place of his influence soon decreasing, as was expected, it increases daily to that degree that several (in the absence of a sufficient solution), believe that the king has been bewitched.”—See *Raumer's History of the XVI. and XVII. Centuries*, vol. ii., p. 268.

† For the honour of royalty we could heartily wish that that celebrated woman Mrs. Hutchinson were chargeable with dealing in exaggerated language in that part of her description of the Court of James in which she says, “the generality of the gentry of the land soon learnt the Court fashion, and every greate house in the country became a sty of uncleanness.”—See *Memoirs of the Life of Col. Hutchinson*, p. 59.

character of James? He would have expatiated triumphantly upon them, it may be said, if he had been acquainted with these facts. Admitting this to be the case, we shall exhibit them to the notice of the reader, not merely because they help to deepen the chorus of testimonies against James, but because this truth becomes in a ten-fold degree more perspicuous that Burnett has not transgressed the bounds of moderation and charity in judging of the king. In the height of his admiration for the "sovereign author," Mr. D'Israeli would have us believe—for he really seems disposed to represent him as the almost faultless model of a king, one of the *deliciæ humani generis*—that all the sentiments of his hero were most lofty and philanthropic—that there was a thoughtful humanity—that he sat enthroned in goodness as in power—and that when compelled to launch the state thunder, mercy always tempered the bolt. "His platonic conceptions," he says, "inspired the most exalted feelings; but his gentle nature never led to *one act of unfeeling despotism*. His sceptre was wreathed with the roses of his fancy; the iron of arbitrary power only struck into the heart in the succeeding reign. James *only menaced with an abstract notion*;* or, in anger, with his own hand would tear out a protestation from the journals of the commons. And when he considered a man as past forgiveness, he condemned him to a slight imprisonment, or moved him to a distant employment; or, if an author, like Coke and Cowell, sent him into retirement to correct his works."† We, however, are greatly mistaken, if we have not in James's conduct positive proof that the praise thus claimed for him is not his right.

In a collection of criminal trials of Scotland, recently given to the public by Mr. Pitcairne, the reader will find some statements relative to James VI. of Scotland, in which there is despotism in its worst form. "His conduct," observes an acute historical critic, "was an uniform system of tyranny, prosecuted according to his talents."‡ Judging, then, from facts, we are necessitated to infer, that, whatever indifference or neglect the Scottish monarch might have shewn to the rights of others, when his own person or under-

* This assertion will surely not be deemed quite correspondent with facts, when it is remembered, that at the very commencement of his reign, James sentenced a thief to the gallows without trial or defence. "I hear our new king" says Sir John Harrington, "has hanged one man before he was tried; it is strangely done—now if the wind bloweth thus, why may not a man be tried before he is hanged."—*Nugæ Antiq.*, vol. i., p. 180.

† See *Inquiry into the Character of James, &c.*, p. 128.

‡ See Millar's *Historical View of the English Government*, vol. iii., p. 176.

standing was reflected upon, he was, while affecting horror of blood, as prompt and resolute in his criminal undertakings as others were in the pursuit of virtuous objects. On such occasions, the law which carries water down a descent was not more irrevocable and fixed than James in his determinations. Upon these three men, John Dixon, John Flemyng, and Francis Tennant, he wreaked his vengeance on account of offences for which, if there had been one elemental particle of generous feeling in his breast, an appeal to it for pardon would have been irresistible. We will detail the case of the last person, as it proves that James, in his eager desire of revenge, was quite as regardless of public disapprobation as they are who, having nothing to lose, are indifferent to the consequences of their actions:—Francis Tennant, merchant, burgess of Edinburgh, was indicted on the 10th of October, 1609, for writing slanderous pasquills against the king. What these pasquills were, it has baffled the indefatigable researches of Mr. Pitcairne to discover. We are instructed, however, to believe they were of a very culpable nature, as the lord advocate refused to name them in process, although he demanded a verdict for these pasquills without the facts of the case being even known to the judges. From these offensive papers being addressed to Mr. Robert Bruce and Mr. John Davidson, ministers in Edinburgh, Mr. Pitcairne conjectures they had reference to the proceedings on the part of James to force the clergy of that capital to avow their belief that his majesty was in imminent peril from the Gowrie conspiracy. Tennant's sentence was death, and a warrant was signed by James, declaring that the delinquent was to be taken to the market cross, his tongue cut out, a paper fixed on his brow, setting forth his crime, and then he was to be hanged:—"He shall be takyn to the mercat crose of Edinburgh, and his tounge cuttit out at the rute; and that thair sall de ane paper affixit upon his brow, bearing that he is convict for forging and geveing out of certaine vyld and seditious pascallis, detracting us and our maist nobill progenitouris; and thairefter that he sall be takyn to the gallous and hangit, ay quhill he be dead." This warrant, however, is rescinded by the merciful king, and, by a rare stretch of his clemency, the culprit is allowed "to be hanged with his tongue in his mouth."

With respect to Higgons's assumption that Burnett is totally unworthy of belief when he asserts James's ardent attachment to the doctrine of the divine appointment of kings, we need only appeal to the writings and speeches of that monarch in testimony of this assertion. How complete was the conviction of the *English Justi-*

nian, as some of his admirers have absurdly styled James, that as kings reigned by the appointment of heaven, so to resist their commands, just or unjust, was opposition to the divine will, is evidenced in almost every page of his singular performance, *The Law of Free Monarchies*. The whole treatise is, indeed, an unvarnished and elaborate exposition of the duty of passive obedience on the part of the subject, without any qualification or restriction whatever on the part of the prince, and a claim to absolute unconditional power. Never was the title of a book more calculated to mislead the reader, since it conveys a meaning quite different from that which we are accustomed to annex to the foregoing precepts; it being the drift and scope of the royal author to give the English people a clear idea of a government directed by the sovereign, released from every check or controul, or, as James aptly designates him, "a free and absolute monarch," such as he appears in the constitution of England, as is laid down in the writings of prerogative lawyers,* where he is an ideal king above law, and not a real king subject to law.

This monarchical theory of James, in which he communicates to his own person a legal and religious character at once despotic and divine,† was made by him so much the idol of his affections, that he

* In reading Blackstone's *Description of the Powers of the Royal Prerogative*, vol. i., p. 160, 162, one fancies that we are perusing those dicta of the ancient lawyers which make the king of England an absolute sovereign.

† The extremes to which James pushed his ultra monarchical ideas, has led the Republican Historian Harris to say, "that he entertained notions of his prerogative amazingly great, and bordering on impiety." But in adorning his person "with some sparkles of divinity," it must in justice to James be remembered, that under the Norman, Plantagenet and Tudor line, we have the same pretensions of reigning by divine right, and therefore of being accountable to none on earth. True also it is, that Bracton and the author of *Fleta*, represent the king as the vicar of God and substitute of Christ upon earth; but then lest flattery should draw improper influences from these titles, they again tell us, when they speak of a real king, and not of the theoretical prerogative of an ideal one, that the law is superior to him, and by which he is made a king. "*In populo regendo*," says the last writer, "*superiores habet (rex) per quam factus est rex*."—Lib. i., cap. 5. It ought never to be forgotten indeed, that these two most learned, and as Warburton justly observes, "almost the only learned of the ancient lawyers." (See *Letters to Hurd*, p. 193). So far from allowing Despotism to find favour in their eyes, give a decisive evidence for our free and limited government, and deduce what some with extreme deficiency of information have stigmatized as a modern theory, and others, though versed in legal lore, have contemplated with a sort of horror as haters of Democracy, the origin of civil power from the people.

sought to palm this belief upon the intellects of his subjects, that next to the knowledge of their God, it was necessary for them to know the things contained in his book ; while so numerous are his allusions to this topic in his speeches, that, in making choice of the following examples, we are guided chiefly by the shortness of the passages :—" The power of kings," he told the parliament, " was like the divine power ; for as God can create and destroy, make and unmake at his pleasure, so kings can give life and death, judge all, and be judged by none."† And in a speech made in the Star Chamber he asserts, " It is atheism and blasphemy to declare what God can do ; good Christians content themselves with his will revealed in his word : so it is presumption and contempt in a subject to dispute what a king can do, or say that a king cannot *do* this or that."† A more undisguised picture of a love of absolute sovereignty cannot well be placed before the eyes of the reader than in these sentences. Nevertheless Higgons will step in and beg him not to infer so and so, because he can assure him that the fact is otherwise.

The essence, we would say, of James's inordinate love of arbitrary authority is concentrated in this striking fact, that, during twelve years of his reign, we have two hundred and fifty proclamations without a single statute. True it is that James, in his speech to parliament, April 5th, 1614, designated, from its surprizing kindliness and concession, " Flowers of Grace," disclaims the doctrine of giving the strength of law to his proclamations. " As touching proclamations, which, in the last parliament, were excepted against, as he is a traitorous subject that will say a king may not proclaim and bind it, so did I never intend proclamations to have force of law,

* To demonstrate to his people, that justice emanated from him really as well as theoretically, James actually sat with his judges in Westminster Hall ; but subservient as they all were to his arbitrary will, with the exception of Coke, he was told by the ermined sages, he could not deliver an opinion.—See Blackstone, vol. iii., p. 41. " It is a remarkable fact," observes Mr. Allen in his admirable work, *An Inquiry into the Rise and Growth of the Royal Prerogative*, p. 98, " that the same reign which for the last time exhibited a king of England interposing in his own person in the administration of justice, should also be the last during which he could be sued like a subject in the courts of law."

† See King James's Works, p. 557. The patriots of the day, in consequence of James having drawn a veil for awhile over liberty, began to be apprehensive they should not leave to their successors that freedom they received from their forefathers, " nor make account of any thing longer than they listed that governed."—Winwood, vol. iii., p. 175. And well indeed they might.

but to prevent sudden mischiefs arising wherein the law hath not provision, until a parliament can provide." But what was this sentimental talk? A mere gilding of the greater grievance of his setting up the civil above the common law—of prohibiting that which was not prohibited—of making no difference "between Middlesex and Morocco"—and, as Clarendon pointedly remarks, of "urging reasons of state for elements of law." Little did James think how indignantly, in the next reign, this kind of distinction would pass for a thing to be loathed by one half of the peers who then, perhaps, assented to it, being a thing so hateful to the common law. "Sergeant Ashley was committed to the Tower,* by the House of Lords, only for asserting in argument that there was a law of state different from the common law: and the "ship-money judges" were impeached, first, for conceiving it might be fitly and safely held, that state necessity would justify the raising money without consent of parliament, and secondly, that the king was judge of that necessity; while the article against Sir William Berkeley was for saying there was a rule of law and a rule of government."†

In his very first parliament, indeed, James showed himself to be utterly indifferent to the policy and justice of maintaining a constitutional government, by attempting to over-rule the electors of the Commons. But this house was not so controllable by his will, or subservient to his designs, as he fondly anticipated, since they were fast progressing in political knowledge. Sir Francis Godwin had been chosen member for Buckinghamshire. His fitness, however, for a legislator, not assimilating with the pattern for that function given by James in his proclamation, the Court of Chancery declared his seat vacant, and, in obedience to its fiat, the county selected another representative. But James, though he may have bowed the spirit of his subjects, had not broken it. For his sturdy Commons set at nought the mandate of the Chancery Court, and persisted in the eligibility of Sir Francis; while, in return for his majesty's most absurd and illegal proclamation, they sent him a remonstrance, the following sentences of which should have served as a beacon and warning to James that their eyes were not so easily to be hoodwinked as he imagined, in matters pertaining to their constitutional rights and privileges. "That, until the reign of Henry the Fourth, all parliament writs were returnable into parliament; and that, though Chancery was directed to receive returns, this was only to

* 3, Carol. I.

† See Rushworth's *Collect.*, vol. ii., p. 609.

keep them for parliament, but not to judge in them;" that the inconvenience would be great if the Chancery might, upon suggestions or sheriff's returns, send writs for new elections, and those not subject to examination in parliament: for so, when fit men were chosen by the counties and boroughs, the lord chancellor or the sheriffs might displace them, and send out new writs until some were chosen to their liking—a thing dangerous in precedent for the time to come."*

M.R.S.L.

(The Second Chapter will be concluded in our next Number.)

CRITICAL NOTICES OF NEW PUBLICATIONS.

The New Botanists' Guide to the Localities of the Rarer Plants of Britain. By Hewett Cottrell Watson; 8vo. London, 1837; Vol. ii. pp. xxiv, 267.

This Volume completes Mr. Watson's *New Botanists' Guide*, and also the execution of his self-imposed undertaking which must have been as laborious as its accomplishment is happy and commendable. It comprises the *Localities of the Rarer Plants of Scotland and the adjacent Isles*, and an ample Supplement to the first portion of his Guide already published. Fifty-one plants with their localities are assigned to the Isle of Man, on the authority of lists communicated to Mr. W. by two friendly correspondents. One of these transmitted, with his catalogue, a small "botanico-geologic chart" on which the island is thus described.

"The Isle of Man is thirty miles long, by about twelve at its broadest part. The greater portion of the island is composed of clay-slate, which at the sea-coast, is overlapped by greywacke and transition-slate. At its north point there is a large tract of sandy marl: this is almost flat, and its central

* *Parliamentary History*, vol. 5. Mr. Hume's *ipse dixit* may be very safely discarded, when he says, "there was reason to believe that this measure being entered into so early in the king's reign, proceeded more from precipitation and mistake, than from any serious design of invading the privileges of parliament," since he must have learnt from the *Basilicon Doron* that he took possession of the English crown with the resolved purpose to maintain the most absolute principles of monarchical power.

part is covered by peat bogs. Sandstone appears at Peel, and the peninsula of Langness is partly composed of sand. At Castleton, the coast is formed of a bed of transition-limestone, the only example of that rock in the island. Beds of peat are interspersed amongst the clay-slate, presenting the same botanical characters as those on the sand. The greatest elevation to which the slate rises is that of Snaefel, which towers to the height of two thousand and seven feet above the level of the sea. The mountainous district generally presents elevations of from one thousand to sixteen hundred feet, but it is unproductive of botanical treasures. There are several species of plants which are common in most places, but which are wanting altogether in this island: these are, the *Lamium album*, *Galium cruciatum*, *Veronica hederifolia*, *Alchemilla vulgaris*, *Geum urbanum*, *Linaria vulgaris*, and others."

After the plants set down for Scotland, come those for the Orkney and Shetland Isles; and, at the end of these, Mr. Watson requests the assistance of botanists in enlarging the catalogue of Shetland plants, so as to render it more complete. Then follows a list of Scottish Species, with reference to the counties under which they are mentioned. It occupies nineteen pages and contains a distinct enumeration of six hundred and sixty-five plants drawn from two hundred and ninety-eight genera whereof an alphabetical index is subjoined. Next in order, stands the Supplement for England and Wales, and this is fraught with much additional and valuable information. The number of species in each county list, for Great Britain and the Islands, amounts to considerably more than twelve thousand, as exhibited in a curious analytical table. It will remain for practical Botanists to estimate the extraordinary amount of mental concentration, exercised on a stock of patience almost inexhaustible, which Mr. W. must have devoted to the preparation of the separate constituent articles of his Guide. If they do not reward, with the highest meed of praise at least, their instructor who has shown himself so zealous, they will incur the charge of being reprehensibly ungrateful. As to his accuracy and faithfulness, let these be tested by experience: valuing highly the authority of two respected and indefatigable botanists often quoted, we can rely on the lists for Leicestershire and the adjacent districts, with unbounded and thankful confidence.

In the Introduction to his first volume, Mr. Watson professed distinctly that he entertained two objects, in publishing his work. His *first* and most desired object was—to ascertain the mere areal distribution of the vegetable species, by making a series of local lists from such materials as were placed within his reach: his *second* aim was—to render his compilation or more justly his composition, an accurate and convenient guide-book to the localities of the least common plants; while, in being fitted to combine easily with the former, it would add considerably to its usefulness. This arrangement created the necessity for his repeating the names of plants in the lists for counties in which they are abundantly frequent, and also for mentioning such vague localities as *Somerset*, *Bristol*, *Norfolk* and the like; but, though useless indications to mere collectors, such notices are very properly intended by him to record the fact of

the plants being found in the county or vicinity pointed out—a fact which will prove exceedingly advantageous to any one investigating the distribution of the species. Besides, since the *New Botanists' Guide* was designed to shew both the localities and the areal distributions of all species entitled to be called *Rare*, with reference to Britain in general, it became necessary that the author should mention them in *all* the counties within which they were certainly known to grow, although they might be common in some *particular* county. The propriety and advantages of this plan are sufficiently obvious, and it is equally manifest that Mr. W. has succeeded in working it up to an astonishing stage of perfection.

Although the method may not be altogether unobjectionable, Mr. Watson has preferred that of selecting a certain set of species according to a fixed test, and then tracing them through the whole of Britain; and, with unquestionable justice, he claims for this process the merit of a decided improvement, inasmuch as it affords the negative evidence available to the botanical geographer. Another peculiarity of his plan, is the exclusion of all the cryptogamic plants. As some persons may regard this as a defect, he wishes them to bear in mind that scarcely one in six of our botanical collectors feel equally interested in the cryptogamian tribes as they do in the others, unless it be for the ferns; but, he suggests, the defect or omission can be remedied by any one who is anxious to have it done, and is willing to bestow on it the requisite time and trouble. Let us hope that the recommendation may be adopted.

With regard to a line of distinction between *Rare* and *Common* plants, that adopted by Mr. Watson is sufficiently determinate; and, in the present extent of our acquaintance with the intricacies and anomalies of Local Botany, it appears clearly to be the best. He remarks judiciously—that, between the least rare of the rarer plants and the least common of the commoner plants, there can only be a shade of difference, and any adopted test will fail of extreme precision; but, in cases where the rarity or commonness of a plant is indistinguishable, it becomes a question of small moment whether it be admitted or rejected, for a distinction. For the Test in his guide-book, Mr. W. has adopted the comparative frequency of a plant in the *Local Floras* he has consulted: it is the substitution of the average observation of several good investigators in different places, for the partial observation of one individual. As yet, the local catalogues are insufficient, in number and extent, for the attainment of complete precision; and therefore, so long as this deficiency remains unsupplied, it is not too much to aver, that the *New Botanists' Guide* will continue to afford the most faithful test for the plants which it enumerates.

Finding that he might be required to answer the question *what useful result is to ensue from such investigations into the distribution of plants*, Mr. Watson tenders his reply in the following instructive and pertinent observations.

"The ultimate tendency of Botany, as of any other science worthy of cultivation, should be found in some beneficial results to the human race, equivalent to the cost of time and money expended on the pursuit. Unless some such results be in prospect, however distantly, it is difficult to conceive what adequate advantages are to be derived from our sedulous efforts to describe and give names to every peculiarity, form and proportion in plants; from our voluminous collections of specimens, dried and living, including the productions of nearly every clime and country; from our intense devotion to the devising of systems and classifications; and from the great expense of time and money necessarily made in effecting all this. Unless there be some prospect of an equivalent return, some reasonable hope of thereby eventually adding much to the stock of power and enjoyment which mankind at present derives from the vegetable world, it will be the duty of political economists to stigmatize botanists as the unproductive consumers or supernumerary drones of society. Now, mere descriptions, mere classifications, mere invention of names, howsoever complete and ingenious, produce nothing to the human race. They only consume time and labour: and, although such occupation may be an agreeable amusement to the parties personally concerned in it, yet, taken alone, it is as valueless to the world as would have been their occupation for an equal length of time at a card-table. We cannot make the earth yield a greater quantity of food and clothing, through means of its vegetable productions, merely by knowing their names, resemblances and structure. After learning these things, which are not to be undervalued as a groundwork for something more, we must still take other steps, by studying the relations existing between vegetables and the rest of the creation. One set of these relations is found in the connections established between vegetation on the one hand, and the physical conditions of its existence on the other; that is to say, the influence of climate, soil and the other external circumstances determining the vegetation of the globe, whether general or special. The more we come to understand these connections, the greater will be our power of modifying them for our benefit. Hitherto, almost all our applied knowledge on this subject has been purely empirical; having been left to farmers and gardeners, who have derived little assistance from technical botanists. Experiments and accidental observations, with some aid from chemistry and mechanical inventions, have enabled practical farmers to augment and improve the vegetable produce of Britain; but, it is hardly saying too much, to suggest that a scientific knowledge of the laws of vegetation, though it will be slowly acquired, must place a future race of cultivators as much above the present workmen, in skill and power, as the scientific chemist of to-day is superior to the cooks and the drug-vendors who were the chemists empirically in the by-gone centuries. The collecting and arranging of facts, such as appear likely to bear upon one department of a study which may become so important to mankind has been my aim hitherto, as it has been the aim of others. No one has yet advanced a step beyond this preliminary labour, in so far as that one department is concerned; and no one can go beyond it, at present. An attempt to do so, would be only a leap from twilight into utter darkness. Even Humboldt himself, so deservedly honoured with the highest reputation as a phytologist, he only collected facts together, and those chiefly the facts ascertained by others, and made an imperfect generalization of them. He could do no more than this, and most assuredly he *built* no *system*; for, how can a system be built, before the constituent materials are half of them procured? Here then, is the answer in reply to the question of usefulness, construing this in a moral or public sense; but, if it were designed to have only an individual application, the reply must be put on the same ground, by reference to individual tastes. One class of minds derive their intellectual gratification from direct or simple observation almost exclusively: a second class of minds are more pleased by occupying themselves with the relations between objects or events. If plants become objects of interest, the former minds describe and classify them; while the latter may feel little interest in

descriptions and classifications, yet derive much pleasure from tracing the relations established between plants and animals, or between plants and their geographical positions. For one of these classes to decry the studies of the other, would be as sensible a proceeding as it would be for the historian to find fault with the moral philosopher, or for the anatomist to censure the physiologist, each because the other had a different taste and pursuit ;" for, he might have added, the constitution of men's minds are as distinct and distinguishable as the shapes of their heads.

These excellent observations of Mr. Watson's are followed by a train of admirable suggestions, the result of experience and reflection, offered to the consideration of any future writer on the typography of our native plants. The high practical value of these suggestions will be readily and fully appreciated by those who may have endeavoured to exercise their ingenuity in perfecting the arrangement of even a limited botanical cabinet and its description. But Mr. Watson will prove unfaithful to his own reputation, and he will materially impede the advancement of his *second* most favourite science, if he shall now withdraw his improving hand from the "Botanists' Guide," for any reason save an unsurmountable necessity. By far the most laborious and difficult part of his undertaking is now triumphantly accomplished: let him, therefore, cease to contemplate an inglorious retirement: far rather, let him be persuaded forthwith to commence an easy and gradual distribution of the articles of his Supplement into their proper positions; and thus, with the contributions of all generous British botanists, he will be enabled ultimately to elaborate a "*new edition carefully revised and greatly augmented*," and printed on writing paper with very "*large margins*" for the insertion of MS. notes and observations. One more suggestion—*Watson began the suggestions*—might be offered; and it is this—that, if at all practicable, the British should receive an engraftment of the Irish phytography, beginning with the meritorious gleanings of Caleb Threlkeld* "that good man," and extending to the fruits of more fortunate researches, in later times.—There is not a book in our native language, better calculated than Mr. Watson's work to ensure the comfort and facilitate the success of an intelligent Naturalist, throughout the progress of a social or solitary botanical excursion.

* As Threlkeld's book was "the first essay of the kind in the kingdom of Ireland," and has now arrived at the honourable distinction of a place among the *Rare Books*, a brief notice of the author and his volume may be acceptable.—Caleb Threlkeld was born in 1676 at Keiberg, in the parish of Kirkoswald in Cumberland. In 1698, he took his degree of "Master of Arts," at the university of Glasgow, where he first experienced a predilection for physic and botany. Having completed the regular course of studies in 1712, he then obtained the degree of "Doctor of Medicine" at Edinburgh; and, in the following year he removed to Dublin where he practised as a physician, during the remainder of his respected and exemplary life. His death took place in 1728, at his house in Frances-street, Dublin, and his remains were attended to the grave by the children of an Institution to which he had acted as physician. He was greatly regretted by the poor to whom he had been, both as a man and as a physician, a most kind and considerate bene-

factor.—Dr. Threlkeld's book is intituled *Synopsis Stirpium Hibernicarum alphabeticè dispositarum : sive Commentatio de Plantis Indigenis præsertim Dublinensibus instituta* : being a short Treatise of Native Plants, especially such as grow spontaneously in the vicinity of Dublin ; with their Latin, English, and Irish names, and an abridgement of their virtues ; with several new discoveries ; with an Appendix of Observations made upon Plants, by Dr. Molyneux, physician to the State in Ireland: the first Essay of this kind in the Kingdom of Ireland : auctore Caleb Threlkeld, M. D.—*Est quiddam prodire tenus, si non datur ultra*:" small 8vo. Dublin, 1727. Dr. T. describes five hundred and thirty-five species alphabetically arranged according to their Latin names, unaccompanied by a regular paging. The appendix is paged, and has the sub-title "*Plants growing in Ireland not yet described*," with the prefatory note—"there are more kinds of marsh and aquatic plants in Ireland, as also mosses, mushrooms and such imperfect plants, than there are in England, and in far greater plenty." Eighty-eight articles are inserted in this list, and it is interspersed with a variety of important and curious observations. Those on the Henbane, Winter-Barley, and Wood-Sorrel, deserve attention. Dr. T. affirms that "what some have suggested, that the Elm is a foreigner in England, and that it is not found northward of Grantham, is trifling and false; for, near the small river of Croglin in Cumberland, from the place where it disembogues itself into the Eden, up to the very Fells, I have seen the Elm grow, some of which are large trees, without any art or culture, and I dare say were never planted by man; it grows often so near the river that the boys could come at its bare roots to peel off the bark."

The Literary Beauty of the Bible, a Lecture delivered in the Literary and Scientific Institution at Staines, Tuesday, November 7th, 1837, being the commencement of its fourth season ; by the Rev. Robert Jones, D. D., Vicar of Bedfont, and Vice-President of the Institution ; 8vo. London, 1837 ; pp. 36.

Dr. Jones makes the title-page of his printed Lecture announce the time and place of its delivery : its object is explained in his introductory observations. He commences thus—

"It is the object of this lecture, to solicit for the Sacred Scriptures a place at least—if not the highest rank—in literary pursuits. The Bible has hitherto been considered too much in a single view—too distinct from liberal enquiries. But, is it instruction only in doctrine and in morals that can be found there? Surely, it merits a larger and more dignified treatment. May it not rank with literature, science, and the arts? May it not extend its empire from the heart to the understanding," in other words, from the affections to the intellect, "and assist in furnishing and embellishing the mind with those powers and graces which crown the philosopher and the scholar? It is for superstition to take refuge in wonders and tradition, or to seek the aid of arms; rather to constrain than persuade. It is for pagan idolatry, conscious of fraud and imposture, to bow down in silence at the feet of science and learning. But Revelation fears no comparison, and shrinks from no tests. As it is the beacon of our immortal hope, and the example of our daily conduct, let it be also the grand basis of our intellectual taste—the rich treasury to us, of all that is beautiful."

Instead of wandering into generalities, Dr. Jones marks out, with much clearness and accuracy, the grounds on which these claims are founded. For this purpose, he arranges his Enquiry under the

three heads—*Sentiment, Diction and Style, and Regularity of Plan*—and, in adopting this division, he follows the canons of sound criticism, as being applicable to every work possessing any pretensions to the name of literature.

I. *Sentiment*.—Under this term, according to Dr. Jones, may be comprehended the principles and opinions of an intelligent being, respecting himself and others. Such sentiment abounds in the wisest and most learned works of all ages and countries; but, however recommended by novelty, excellence or beauty, it cannot have that weight which the sentiments expressed in the Holy Volume so justly and so imperatively claim. The reasons of this superiority are obvious,—the veracity on which human sentiments are rested, and the sanctions by which they are enforced, are infinitely inferior; they cannot have the infallibility which pertains exclusively to the Word of God. Mankind, therefore, are constrained to pay immediate and implicit obedience to Scriptural sentiment, because it emanates from wisdom that is perfect and never errs.

Dr. Jones evinces with many apt and conclusive illustrations—that, for its exquisite adaptations to expand the mind, refine the taste, improve the understanding and judgment, beautify the life, purify and exalt the nature of man, the Scriptural Sentiment is supremely excellent, in all respects, over the highest and best instances of pathos or sublimity to be found in the stores of polite literature. He concludes this first branch of his lecture, with the observations;

“I conceive that this review of Scripture Morality comes within the legitimate range of my subject. If that which is pure and becoming in sentiment runs, like a golden thread through the philosophy of an Aristotle, or a Cicero, with what a more heavenly grace and dignity are the ethics of the Gospel clad. Classic philosophy may tell us to worship God, but Christianity adds—‘*in spirit and in truth*.’ If that would enjoin us to love our neighbour, how is the precept spiritualized and ennobled by the gospel-rule—‘*to do good to them who hate us and despitefully use us*.’ Let us suppose ourselves the auditors of the Sermon on the Mount, that practical summary of universal motive and duty. It furnishes, not merely an outward shew of goodness, often assumed from a sheer regard to respectability, but it tries the very thoughts and the conscience. With what sublime simplicity, with what homely allusions yet winning eloquence, with what an evident and ardent concern for man, are its precepts addressed. The instances of the true sublime and beautiful are not prized by us as they deserve to be; but were those adduced now for the first time disclosed, I should have little trouble in the enforcement of my thesis—*The Literary Beauty of the Holy Scriptures*.”

II. *Diction and Style*.—Dr. Jones manifests a vigorous activity of the faculty of language and its organ, while descanting on the excellency of biblical diction, and shewing this by reference and illustration. His transition from *sentiment* to *style* comes in these words;

“The very spirit of literary beauty depends so mainly upon the external form and dress of language, that words become things. So intimate and harmonious is the bond, that the very strength and beauty of the thought con-

veyed, arise from the mode of expression. The difficult, secret and happy effect of style consists in adapting the expression to the exact sentiment or sense intended to be understood. Herein centres the highest merit in speaking or writing—'to describe humble things with delicacy; great things with gravity; and such things as are alike removed from both, with equability and ease.' The Holy Scriptures are a wide and fertile field, in which all this variety may be found; and where else are they treated so strictly and so beautifully, in obedience to this rule? If the minutiae of the Jewish law solicit our attention, they are related in a familiar way, and yet without the least approach to coarseness: but, if the subject be lofty, with what thrilling solemnity is its diction clothed: and, if a plain history of facts demands our attention, perspicuity of statement and artless eloquence invest the narration with an identity which no embellishment can command: vividly and graphically it comes before our view. The Scripture diction, moreover, is graced and diversified with remarkable peculiarities of style. If we select the great Apostle of the Gentiles; in his epistles, are united the concise and the beautiful: they are distinguished by a condensed and energetic expression, by a short but most impressive turn of sentence, wherein there is no dryness, or wearying sameness. St. Paul's style of writing is every way worthy of the greatness and diversity of his subject. At times, he seems to combine the separate excellencies of all the other sacred writers—the majesty of Isaiah, the devotion of David, the pathos of Jeremiah, the vehemence of Ezekiel, the sublimity of St. John, the noble energy of St. Peter. Unambitious of ornament, his style is as varied as his discourses. He is, by turns, vehement and tender, didactic and impassioned: now, pursuing his argument with logical precision, and then disdaining the rules of which he was so complete a master—thus making his noble neglect more impressive and convincing than the most elaborate elocution. In his diction, the mass of thought, the mournful yet touching examples, the deep feeling, the holy melody of the language, breathe the very loftiness and fortitude they would inspire. Nothing can be more illustrative, and yet apposite, than his allusions and metaphors: he enforces on the Hebrews the doctrine of salvation through Christ, by a reference to the rites, ceremonies and economy of the Jewish dispensation. To the inhabitants of Achaia, how apt and beautiful is his illustration and how impressive is his moral when alluding to the abstinence required by competitors in the Isthmian games, he gives it a spiritual comment by insisting on the subjugation of unruly passions in the Christian combatant. The close of his analogy is eminently apposite and new, when he compares the value and duration of the frail and fading garland worn by the victorious Greek, with the incorruptible crown of the Christian conqueror. There is scarcely a beauty in style or expression with which Scripture diction is not enriched. With the most precise and logical brevity, it sometimes appeals to the judgment; again, it rises in dignity, and arrayed with all the gorgeous plenitude of imagery, it wins the fancy. While, in its didactic precepts, it stoops to the humblest mind, it delights and rewards the most cultivated taste, not merely of a Christian taught and schooled to admire and magnify what it loves and prizes, but the taste even of a pagan—and yet more, the taste of an infidel. Even the unbelieving Rousseau confesses that Socrates, the beloved idol of his insane devotion, fades into insignificance and nothingness, before the awful dignity, the matchless purity, the love, the charity, the humility, the holiness, the god-head of Jesus Christ. The fine imagination of this gifted writer was fixed with the *Sublime* of Christianity. And herein are exemplified its power and attractiveness; here is the influence of the Scripture style, arranged with all the grandeur of truth, the magnificence of reality. There is nothing so likely to win the heart as the disclosure of stupendous veracities; it needs, it employs no embellishment. Coarseness or want of taste has no affinity with piety: there is a severity, a solemnity, more subduing than wordy eloquence."

III. *Regularity of Plan.*—This last division of Dr. Jones's lecture is opened with some general remarks on the advantages of order and system in composition. Evidently expressing intuitive experience, he observes :—

"Though method and arrangement may be the more retired and secret fund of literary beauty, and known as well as prized by those whose large comprehension enables them to take wide and therefore accurate views, still order is ever pleasing, even to the humblest minds that cannot comprehend its symmetry and its rules. At the same time, the highest because the most intellectual pleasure does await him who can discover and value the various well-apportioned and adjusted sections of a system or a treatise, and observe with what adaptation and evidence each part conspires to develope, illustrate and confirm the main whole. Hence we find the admiration of critics, both ancient and modern, warmed indeed by the sentiment and diction of Homer, yet stimulated to a degree of enthusiastic admiration when their attention is turned to the identity of character, the consistent plan, the transparent method to be found in his two immortal poems. If plan and arrangement, the offspring of mere human talent, be attended with such a power, what may we not expect from the Divine mind? Let us therefore inquire, if this source also of literary beauty and delight is not to be found in the Holy Scriptures, which contain a mine of wisdom and of mercy; and, the further and deeper the search, the richer and more abundant is the reward. Can there then be any subject better qualified at once to satisfy and sanctify inquiry, than to trace out the mighty and mysterious clue of the Divine economy?"

With this most interesting inquiry Dr. Jones completes the last head of his lecture; and, like the rest, this abounds with observations well-calculated to secure the respect and improvement of the simple and the wise, of the unlearned and of them who excel in knowledge. Thus, he says :—

"We shall find the Bible to be the work of one Divine author, with its great and ultimate design carried on, through different dispensations, but still through human agencies and national events. That design commences with the beginning of time, and ends when time shall be no more. Naturally therefore, may we look for that unity of intention and specific purpose, which as the unerring proof of high intellect among men cannot but be expected in the perfect councils and word of God. What then do we absolutely find? We find, in the writings of Moses, that after a short but most impressive detail of Adam's primitive happiness and of his fall from that state of bliss and purity, the grand, the gracious object of all the succeeding dealings of God with man, is at once proposed—the promise of pardon to fallen man and his restoration to his Creator's favour. This, as the well-spring of life immortal, diffuses its healing streams through every page of the sacred volume: it hallows all its precepts, and evangelizes all its prophecies. Still, human means and agencies were called forth, under the divine guidance. The first step taken to accomplish this glorious end, was the selection of the Jews from the midst of an idolatrous and pagan world, sunk in vice and ignorance. Laws were ordained, and services appointed to preserve this people a peculiar and chosen race. The rites and ceremonies enjoined, had at once the effect of signifying better promises to come, while their observance kept up a civil and national distinction—a total identity. If again, we look to the prophecies, we shall see the designs of divine mercy gradually and more clearly developing, growing stronger and more explicit, on the approach of that glorious event which they predicted. If we carry the mind further, and

contemplate the actual advent of Him, '*the Desire of all Nations*,' with awe and admiration, we shall behold the means verified and lost in the fulfilment; prophecy completed; the shadow vanishing before the substance; the time, the place, the character of the Messiah distinctly marked; the page of the Old Testament visibly and literally fulfilled in the New; the attestation of miracles; the calling in of the Gentiles; the out-pouring of the Holy Spirit; and the triumphant spread of the Gospel. Each and all of these circumstances contribute to prove the connexion, the harmony, the wisdom of design, and regularity of plan, which evince a wholeness, a oneness in the Holy Scriptures. Thus has my purpose been accomplished, in establishing the *Literary Beauty of the Bible*. Its two Testaments unite harmoniously to form one grand Epic; they concur in one transcendent uniform view; and come equally from the same divine intelligence. The *Sentiment* accordingly is of such wisdom and purity, the *Diction* is so varied and well-suited, the *Plan* so consistently conducted, and the *Object* so glorious and momentous in its fulfilment, that they cannot but be prized by every mind alive to literary perfection. Yet this is not the only excellence or the best fruit of sacred studies. Taste and beauty do not here, as on other subjects, merely satisfy the judgment, soften the manners and delight the imagination: here it is, that the heart is led captive to virtue, the weightiest motives are supplied, the life is made holy, the hope becomes immortal, the elegances of literature and the graces of religion go hand in hand, the man of science is no longer deceived by '*philosophy falsely so called*,' and the scholar is completed in the Christian."

With a most praise-worthy discretion, Dr. Jones has carefully and successfully, throughout his eloquent and persuasive Lecture, avoided the discussion of an exclusively theological subject; he has meddled with no sect; he has touched upon no doctrines except those which constitute the foundations of general christianity. In his own words—

"He has led you to the Scriptures, as unto a fount of pure and living water, to cheer and recruit you in your pilgrimage through this weary world. Our courage does become holier, and our intellects do become brighter from a daily study of the divine page. O, he fervently exclaims, "it is a paltry earth-born ambition which urges us on if, in Literary and Scientific Institutions, we seem ashamed of naming the name of God and of tracing up to one sole good and perfect Cause, the wonders, the mercies and the wisdom, clinging and clustering around our path, at every fresh step into the phenomena of Nature. Let us hurl back, with holy denial, the imputation—that this Institution must, in time, become a school of infidelity; that literature and science infallibly deaden the mind to sacred studies and the life to pious deeds and gentle charities. Let us then, in refutation of the charge, make Christianity the basis of all our endeavours to diffuse mental illumination. Knowledge, without religion, is power; but it is power which may be, and too often has been, employed banefully and ruinously. Let us remember, and justify, and courageously avow our Conviction, that '*righteousness exalteth a nation*,' and that '*the fear of the Lord is the beginning of wisdom*.' We are not afraid of facts, or the science which develops them; but we do resist and deprecate every unfair treatment of Holy Writ. Be as scientific as you please, but leave Scripture to its own evidence. Christianity is the Queen of Knowledge, the nursing-mother of all that is great and good. Wherever the Gospel, in its purity, is realized, there do learning, science and the arts take root and flourish. Let us not deify reason, for our idol will not avail us. Was a motto to be placed over this rostrum, I should choose, **FEAR GOD AND HONOUR THE QUEEN.**—On the subject of *Popular Enlightenment*, I am perfectly convinced that it is easily and delightfully practicable,

to be most true and faithful to the Church of England, and yet to be the zealous Champion of an outspread of knowledge, fenced and sanctified by religion, through the length and the breadth of the united kingdom."

There is not—assuredly there is not—a liberal heart within the limits of our own beloved Island, that will not respond with generous acclamation to the wise and philanthropic principles so earnestly as well as happily advocated in Dr. Jones' Lecture; and, at the same time, that will not offer up the most devout aspirations to the Supreme Source of all true knowledge and happiness, for increasing prosperity to the Staines' Institution, with the highest reward of philanthropy to its devoted and venerable Vice-president.

The Spirit of the Woods, illustrated by coloured engravings. By the author of *The Moral of Flowers*. 1 vol. 8vo. London, 1837.

"With gentle hand,
Touch—for there is a spirit in the woods."

SUCH is the advice of Wordsworth, which assuredly we will follow; not only because the work is the production of a lady, and therefore deserves to be handled gently, but because it is executed in a style to disarm the most ungallant critic who recognizes no sex in a printed volume. Yet we can scarcely understand how this can be; for cold must be the heart, and dull the eye, that feels not, sees not, at a first glance, and on the perusal of a single page, that we are indebted for this most elegant volume to the soft pencil and finer pen of a lady. How great is our privilege to be allowed to walk through the forest glades in company with one so deeply skilled in

"that language
Which flowers can speak—
Each hue a word, each leaf a thought"—

To which utterance is given in divers comments on the form, foliage, and effect, as regards the picturesque, the beautiful, and the sublime, of each tree we may encounter; the whole summed up in verse, tuned to the music of a thankful heart. And thus the strains which the children of the forest are made to breathe are more grateful to a rational spirit than when ancient poets spoke the language of the fabled dryads. With such an instructive guide would we wish to traverse field and holt, either

"in the youthful hour
Of spring, when every little flower
Its timid eye was closing;"

or

"when the stormy winds of winter
rouse

The wide old wood from his majestic rest,
 Summoning from the innumerable boughs
 The strange deep melodies that haunt his breast."

Without further preface, we will introduce the fair writer to our readers, in the following just remarks on trees in general :—

" Trees are full of moral associations, regarded under which impression, they possess even 'something than 'beauty dearer.' Many of them are rich in historic interest, and chronicle events of national importance; others confine themselves to a more limited range of observation, and recalling the memory of some renowned individual, lead us beneath their shade to 'hold converse with the mighty dead.' But where this peculiar charm is wanting, imagination bodies forth scenes and stories of its own creating, and 'gives to airy nothing a local habitation and a name.' An aged tree points to the past—a sapling to the future; and whilst the mind is exercised in these remote contemplations, we feel the force of Dr. Johnson's well-known observation :—' Whatever withdraws us from the power of our senses—whatever makes the past, the distant, or the future predominate over the present—advances us in the dignity of thinking beings.'"

In working out her plan, she has freely levied contributions from other writers on trees, and assimilated many choice allusions of the poets to the subject under treatment. Something is, in this way, provided to suit every taste. Ample as are these quotations and the legends which they sometimes introduce, we could have wished, when speaking of the Aspen and the superstitions indulged in by rude nations as to the origin of its perpetual motion, she had noticed that prevalent in the north of Europe, viz., when Christ entered Jerusalem amid hosannas, every tree bowed its head but the stately and haughty poplar, which was, therefore, condemned to shake and tremble till the second coming of its Lord. This superstition has been adopted in a poem by Ahlenslager, which was ably translated in *The Foreign Literary Review* several years ago.

However willing we may be to indulge in extended quotation, our limits compel us to take the following on the Scotch Fir, not for its superiority over other passages, but for its shortness :—

But a higher and more honourable distinction belongs to the tribe in the frequent allusions made to it in Holy Writ; the Fir, along with the Cedar, was used for the planks and beams in the erection of the glorious temple of Solomon. And in many passages it is also associated with that noble tree in conveying images of prosperity and sublimity. From the sonorous quality of its wood, it is chosen, almost before any other, for musical instruments. Even in the early ages its adaptation to such uses was recognized; for we read when David brought up the ark from the house of Abinadab, he 'and all the house of Israel played before the Lord on all manner of instruments made of Fir-wood; even on harps, and on psalteries, and on timbrels, and on cornets, and on cymbals.' It is still used in our days for similar purposes; and in a fanciful view, there is a strange but beautiful anomaly in this braver of the tempest administering to the devotional and tender emotions of the heart."

" Thy throne a rock! thy canopy the skies!
 And, circled in the mountain's dark embrace,

'Mid what stern pomp thy towering branches rise!
 How wild—how lonely—is thy dwelling place!
 In the rich mead a God of love we trace,
 We feel His bounty in the sun and shower;
 But here His milder glories shun our gaze,
 Lost in the one dread attribute of power.
 I cannot chuse but wish thou hadst a fairer bower.

"Yet, to the scene, thy stately form doth give
 Appropriate grace; and in thy mountain hold,
 Like flowers with zephyrs, 'at the shut of eve,'
 Thou with the storm hast dallied from of old.
 But stateliness of form and bearing bold
 Are not thy only boast: there dwells in thee
 A soft, sweet spell (if we be rightly told),
 Which waiteth but the touch of harmony,
 To soothe the brow of care, and make e'en sorrow flee.

"Thus be't with me! When storms of trouble rise—
 Which all of woman born, alas! must know—
 Built on a rock, and looking to the skies,
 Like thee, undaunted may I meet the blow.
 Not so when called to hear of others' woe:
 Then may soft pity touch some chord within,
 Prompting the tear of sympathy to flow,
 And words of healing, such as gently win
 The mourner's stricken heart, and pour soft comfort in.

The volume, which, in its outward embellishments, displays great taste, contains twenty-six coloured engravings of trees, from drawings by the accomplished authoress. Of these it is but justice to say that the outline of the foliage is most strikingly correct. Reluctant as we are to

"Hint a fault, or hesitate dislike,"

we cannot speak in the same unqualified terms of the colouring, since we have heard those to whose judgment we must bow in this point question its *truthfulness*. This fault, however, lies not with the authoress, and is easy of correction in the future copies and editions.

On the Natural History and Classification of Birds. By William Swainson, A.C.G., F.R.S., F.L.S., &c. Vol. II. London: Longman & Co., and John Taylor. 1837.

AFTER the critical notices which we have from time to time given of Mr. Swainson's works, and considering the long acknowledged ability of that gentleman as a scientific zoologist, we shall, on the present occasion, confine ourselves to a few words; indeed, a considerable portion of the volume scarcely admits of analysis.

The early part of the book is dedicated to a continuation of the explanation of the orders and other larger groups of modern Orni-

thology, the *Dentirostres*, *Rasores*, *Grallatores*, and *Natatores*, being respectively and fully treated of in the most satisfactory manner. That a reviewer should coincide in all the views of his author is a thing not to be expected; we, accordingly, taking advantage of the undisputed privilege of our craft, had marked several passages whereon to comment. But the faults—if such they be—to which we allude are of minor importance.

The volume concludes with the characters of the various genera, briefly and concisely written. The illustrative wood-cuts are frequently less accurate than we could wish. Although they might "pass muster" with the generality of readers, they are, in many instances, not executed with that attention to minute particulars so desirable in a scientific work, and one intended to be standard. There are, likewise, several typographical errors, some of considerable importance.

On the whole we consider this volume by no means inferior in value to its predecessors. We will conclude by recommending that a little wholesome admonition be given to the engraver and to the "printer's devil," and by observing that our author's descriptions of new species will appear in a future volume of his admirable series.

A Lecture on Education, delivered in the Freemasons' Hall, at the Opening of the Second Session of the Edinburgh Association of the Working Classes, for their Social, Intellectual and Moral Improvement; Monday 16th October, 1837; by W. B. Hodgson; 8vo. Edinburgh, 1837; pp. 48.

Mr. W. Lectures with becoming dignity; his manner is very serious; his enunciations quite didactic; his logic not distinctly antiquated, being a sort of liberal induction. He takes permission, at page 6, "to assume—that education ought to aim at attaining the objects of existence, and that the objects of existence are the enjoyment and diffusion of happiness;" and, at p. 13, he lays down "the great principle—that no system of education is complete, which fails to communicate a connected view of science, that is, of the nature of man, and the objects with which he is surrounded in this world." At p. 14, he repeats his opinion, previously expressed regarding "the inefficacy of moral and religious training through the medium of the memory:" he had said at p. 7, "if we wish to excite the moral sentiments, we must not commit moral principles to memory, for these exercise merely the intellect which retain them, and leave the heart untouched; we must furnish them with their corresponding objects." On the same page he affirms that "mind consists of a number of various powers," and he views it as composed of the Propensities, Moral Sentiments, the-Immaginate Powers, and the Intellectual Faculties: *all these*, he adds, "must be comprehended in every perfect system of education." So say we explicitly; but we blame the lecturer for inconsistency in that he discourages education of the very highest

"moral sentiments," in that he abstains from making education in religion—in Revealed Religion—the foundation and paramount principle of his "perfect system."

He professes the phrenological philosophy: and this maintains the doctrine that the "*Supremacy of the Moral Sentiments*," in all mental exercise and government, is a distinct and eternal institution of the Supreme Creator. Now, the most exalted, from their being the most responsible, of all the "moral sentiments"—*of all the mental faculties*—are those which dispose man to worship a deity, to do justice, to practice mercy, and to hope for immortality. Wherefore, instructed by Phrenology, we do affirm, and are fully prepared to shew, that no system of education can be a "perfect system," unless it includes a predominant and special provision for educating the innate "moral sentiments," which intuitively and naturally dispose Man to be a religious Being, desirous of being led, through virtue, to the reception of everlasting happiness.

FINE ARTS.

MUSIC.—VOCAL.

A Funeral Anthem on the Death of the late Charles Wesley. By Samuel Wesley. London: J. A. Novello, 69, Dean-street, Soho.

WE have yet to discover the proofs of Samuel Wesley's greatness as a composer. From what we have already seen of his works, we suspect that his pretensions have been greatly exaggerated by a certain party in this country, that through the trumpet-blasts of this party he has, in the present day, acquired a celebrity which posterity, far from raising, will considerably lower; and that, whatever may have been his merits as a performer on the organ, or even as a sound musician, he will never take his stand amongst the master-minds who have advanced the art by the invention of a new style, and by bringing new and untried resources to bear upon the latent emotions of the soul. His temporary celebrity we attribute rather to the exceeding dearth of talent among his contemporaries in this country than to any intrinsic greatness of mind; rather to the force of favourable circumstances, than to the possession of that power which controuls and overcomes the most adverse. An ordinary mortal, he lived amid a race of Lilliputians; what wonder, then, that these should regard him as the great "man mountain"

capable of performing wonders and (to them) impossibilities? It is this comparison with a low, an exceedingly low standard, that, for more than a century, has been the bane, as it has been the pride, of English musicians. They have rarely looked beyond their own limited sphere, rarely enlarged their minds by an extended survey of what was going on in other lands, and of the discoveries which were every day being made by those who infinitely surpassed them in research as well as in native power. To this unfortunate and narrow-minded tendency must we, in great measure, look for an explanation of the inferiority of our composers, since the time of Purcell, as compared with the bright luminaries who so thickly bestudded the musical firmament of our continental neighbours. The time was, indeed, when the works produced by our countrymen, instead of suffering by a comparison with those of the continent, received rather additional lustre from the juxtaposition. Witness, amongst others, the names of Tye, Tallis, Bird, Orlando Gibbons, and Henry Purcell, whose works, unfaded by time, still live, and ever will live, to attest their greatness, and to bear witness that in Music, as in other things, England may lift up her head amid her proudest rivals without a blush. We hope to see the time when she will again assert her equality, if not her superiority, and regain with honour the position she once so nobly held. The power, we doubt not, is present, and, once more directed into the proper channels, will manifest itself the more conspicuously from its temporary misdirection and inefficiency.

Of the anthem at the head of the present article but little need be said. It is the commonplace production of a commonplace mind; enlivened by no single spark of genius, it drags its weary length along; as it begins so it ends, in solemn unmitigated dullness. The only wonderful point about it is the ingenuity with which so many notes are strung together to so lamentably little purpose, and the extreme dexterity with which all feeling, all enthusiasm, is banished, in order to preserve the whole in unmeaning uniformity and frigid inanity.

INSTRUMENTAL.

Chefs d'Œuvres de Mozart, a new and correct edition of the piano-forte works (with and without accompaniments) of this celebrated composer. Edited by Cipriani Potter. Nos. 2, 3, 12, 13, and 14. London: Coventry and Hollier, 71, Dean-street, Soho.

THE republication of classical music by some of the first houses, and edited by eminent musicians, is a sign of the times which augurs well for the prospects of art in this country. The assertion that the English feel no enthusiasm for music, is contrary to fact: witness the time and money expended in the pursuit. But their efforts are too often wasted on trifles intrinsically incapable of yielding an adequate return of pleasure. It is a fallacy to regard bad taste as

something inherent in an individual, as forming a part of his nature; it were more correct to consider it as that partial and imperfect cultivation of the mental powers which is the necessary consequence of employing them upon the mean, the frivolous, and the insignificant. Men naturally take as their standard of excellence those productions of art with which they are acquainted; and, if informed of higher efforts, believe the evidence of their own senses in preference to the report of others. Hence, to lay before the public really good music is more conducive to the improvement of their taste than the most eloquent declamation. It were unreasonable, indeed, to expect that a solitary specimen of sublimity or beauty should suffice to counteract long-established usage and firmly-rooted tastes; but we have too much confidence in the powers of genius to doubt its capability of overcoming dulness, provided a fair field be allowed for the fight. Were it made the rule, instead of the exception, to place before the pupil classical music, as soon as she has acquired (by means of exercises) execution sufficient to prevent mechanical difficulties from interfering with the requisite attention to the meaning of the piece, then would bad taste become powerless by being confined to the few whose intellectual powers are unequal to the perception of beauty. And when we consider that the greatest masters, from the time of Sebastian Bach to the present day, have composed for the instrument most commonly learnt by amateurs, it seems, at first sight, incomprehensible that the majority should have neglected works akin to inspiration, and devoted themselves to the worship of mediocrity and commonplace. With the causes which have induced the preference of fourth and fifth-rate writers to those powerful minds who seem to have grasped the whole range of art, we have at present no concern. Suffice it that Bach, Handel, Haydn, Mozart, Beethoven, and Weber, who all attained their fame in the higher walks of the art, have condescended to write for that miniature orchestra, the piano-forte. So all-pervading, too, was their genius that their piano-forte works alone would have sufficed to rank them as the most inventive and original of composers.

Truly delightful, then, is it to find that Mozart, whom Dr. Crotch has justly termed the greatest of modern composers, has now a fair chance of receiving his due share of admiration from that numerous class, the piano-forte players of this country. It would seem that in England no composer can become generally known who does not favour us with his bodily presence. On other grounds it would be difficult to account for the neglect of Bach, Leo, Graun, &c., among church composers, and of Mozart as an instrumental writer. Had not his premature death prevented the fulfilment of his engagement to Salomon, his admirable flights of fancy would have been found on every piano. While, however, his contemporaries, Dussek, Clementi, Steibelt, Pleyel, and Woelfl, all immeasurably his inferiors in creative power, though each possessing some excellence peculiar to himself, attained, during their respective life-

times, to the zenith of their popularity, the claims of Mozart as the originator of a new style for the piano-forte were totally neglected.

That Mozart was the true founder of modern piano-forte music will hardly be doubted by those acquainted with his works for that instrument, as well as with those of his predecessors and cotemporaries. Haydn's *adagios* might be taken for songs divested of their words, and his *allegros* partake largely of the character of his predecessors. He was no performer himself, and his sonatas exercised little more influence over the style of writing for the instrument than if they had been only adaptations from the orchestra. With regard to Clementi, who has been styled "the father of modern piano-forte music," a reference to dates will show that, at the time when he was yet a mere performer, Mozart had delighted the German public as well with the richness and novelty of his ideas as by the brilliancy of his execution. When Clementi came to England he was well acquainted with the compositions of Mozart, with whom he had often played in public. But if little direct benefit was derived from Mozart's piano-forte works, much was gained indirectly by their influence on those of other composers. Cramer, whom the English have long looked up to as the head of the *true* piano-forte school, adopted the great German as his model. We confess we are not of those who delight in setting up forms and modes in array against each other. We care not for the style, the manner, or the form, so long as genius, idea, or mind, is present; and if the eloquence of Mozart's soul-absorbing phrases cannot reason piano-forte players into the same way of thinking, then, indeed, may we despair of their taste. We despise while we pity the affected exclamation of the fashionable world, that Mozart is *passé*; and they need hardly be offended if we declare that with minds like his they never have felt sympathy. Fifty years ago they delighted in Pucitta and Von Esch; let them now applaud Herz and Donizetti.

To the daily increasing number of art's lovers we must, notwithstanding the brevity of our space, say a few words on the characteristics of Mozart's writings for the piano-forte. To the trite observation that "melody is the soul of music" we fully subscribe, although we feel inclined to differ from many who make the assertion as to what shall properly be called melody. Assuredly not the threadbare *motivi* of most modern composers, which owe their slender attractions to the jingling consonances afforded by the fundamental bass. Would you learn what melody is, ask of any great master, of Sebastian Bach, of Handel, of Mozart, of Beethoven; they will give you a better idea than any critical definition is capable of imparting. Suffer not yourselves to be misled by the notion that the ancient masters cultivated harmony at the expense of melody: such is the shallow conceit of those who, being incapable of comprehending their thoughts, endeavour to fasten on the composer the blame in reality attached to themselves. The florid counter-

point of the ecclesiastical composers is rich in melodies simultaneously progressing and leading to one common end; it has been reserved for modern times to produce graceful melodies which the accompaniment only serves to sustain and relieve. It is the combination of the two styles which constitutes the charm of Mozart's writing. He begins with a theme accompanied with the simplest harmonies, but his fertile fancy soon suggests other melodies fascinating as the first, with which they are artfully interwoven, and which lead him naturally and gracefully into the most distant keys. Now they are bedecked with all the luxuriance of modern ornament; now subside into choral-like gravity. Does any one thought seem to usurp precedence, others speedily assert their claim to admiration. Above all, whether he revels in chromatic intricacy, whether his mood be plaintive or joyous, he is ever easy, natural, and unconstrained. Every note bears the impress of flowing from the heart; nothing is laboured, nothing constrained.

Of the compositions before us, beautiful as they all are, our space only permits us to notice three. No. 2 in B \flat consists of a *largo*, an *allegro* and *andante*, and an *allegretto*, each excellent in their way; but the *andante*, with its mysterious modulations, is our favourite: the violin part (obligato) is admirable, and within the compass of a moderate performer. We know of no greater inducement for amateurs to cultivate this wonderful instrument than the enjoyment which, in domestic performance, they may give and receive by contributing their share to the production of these charming compositions. No. 3 is a fantasia and sonata, both in C minor, and in the sombre and plaintive style peculiar to their author. Familiar as we have long been with these compositions, every successive perusal develops new beauties. No. 14, a rondo in A, is a complete novelty to us; it is not to be found in our foreign edition (Simrock, at Bonn), and we believe it has never before been published. Sparkling, gay, and brilliant, it forms a striking contrast to the work just noticed, and serves still farther to illustrate the extraordinary versatility of the composer. The mechanical difficulties which it contains will easily be surmounted by any one who has played Cramer's studio.

We must now reluctantly conclude our notice, but not, however, without sincerely thanking the spirited publishers and the talented arranger for the pleasure they have afforded us. Messrs. Coventry and Hollier will be immortalised in the annals of musical art, by having dared to outstrip public opinion in the publication of Sebastian Bach's sublime organ studies. They have now increased their claims on our gratitude by presenting to the world, in an elegant form, the *chefs d'œuvres* of one of the greatest of piano-forte composers. That their efforts may be repaid by success, and that these enchanting works may find a place on every piano and resound in every drawing-room in the land, must be the sincere wish of all true friends of music.

A Studio for the Organ, exemplified in a series of exercises in the strict and free styles, intended as voluntaries for the use of organists. By Samuel Wesley. No. 1. London: D'Almaine & Co., Soho-square.

To call that a "studio for the organ" which any one capable of performing Bach's works for that instrument could play at first sight, is, to say the least of it, an amusing piece of self-conceit. Such, however, is the case with the present *Studio*, in which, if there is nothing for even an ordinary performer to study, there is still less for the scientific musician to admire. An introduction, consisting of passages exceedingly simple and not very new; and a fugue such as any one acquainted with the rules of composition might produce by the dozen without any remarkable stretch of thought, and as any one who has got over the first mechanical difficulties could play at sight: such is the composition of the first number of this studio by the "English Sebastian Bach." Unless what is to follow be infinitely more worthy of admiration and of study, how woefully have the public been deceived by those who have—we cannot conceive for what reason—endeavoured to raise the reputation of this composer so greatly above its just level!

Three Romances for the Piano-forte. Composed by William Stern-dale Bennett.

Three Musical Sketches for the Piano-forte, entitled the Lake, the Mill-stream, and the Fountain. By the same. London: Coventry & Hollier.

THESE are the only works of this young composer that we have as yet seen, and they make us desire a further acquaintance with the products of his genius. The character of both is nearly the same—romantic and tasteful, perhaps even poetical, without any particular display either of originality or force of thought. Sketches, as a title, appears to us inappropriate. They are rather highly-polished miniatures, betraying something of labour in their composition, and hence, perhaps, wanting in that vigour and breadth of effect which should distinguish the sketches of the master. Miniatures or sketches, however, they are pleasing, and at the same time give promise of higher achievements.

L'art de la Fugue. Par Jean Sebastian Bach. 'A Paris: chez Richaut, Boulevard Poissonière.

WE regret sincerely that it is out of our power to notice an English edition of this unique master-work, but none such, we shame to say it, exists. As a *practical* treatise on the art of fugue it is worth all the *theoretical* that ever were written, and contains finer specimens in this style than have ever been given to the world by any other composer. We cannot do better than describe it in For-

kel's words:—"This admirable work did not appear till after the author's death in 1752, but was, for the most part, engraved by one of his sons during his life-time. Marpung, then at the head of the musical writers in Germany, accompanied this edition with a preface, which contains many just observations on the utility of works of this kind. This work, however, was too high for the world in general; it was forced to withdraw into the narrow circle occupied by a few connoisseurs. It consists of variations, on a great scale. The intention of the author was to show clearly what can possibly be done with the theme of a fugue. The variations are all complete fugues upon the same theme, and are here called counterpoints. The last but one has three subjects, and in the third the composer discovers his name by BACH.* This fugue was, however, interrupted by the disorder in the author's eyes, and, as the operation did not succeed, was not finished. It is said to have been his intention to take in the last fugue four themes, to reverse them in all the four parts, and thus to close his great work. To make up for what is wanting to the last fugue, there is added to the end of the work the four-part choral,† Wenn wir in höchster Nöthen sind. Of the art displayed in this choral I will say nothing; but the expression of pious resignation and devotion in it has always affected me when I have played it: and I can hardly say which I would rather miss, this choral or the end of the last fugue."

We hope that our notice of this sublime work will induce some enterprising and patriotic publisher to bring out an edition of it, and to give English musicians an idea of what a fugue really is in the hands of a great master.

PROCEEDINGS OF SOCIETIES.

ST. JAMES'S ORNITHOLOGICAL SOCIETY.

THE first general meeting of this Society for the present session was held at the rooms of the Society, 57, Pall Mall; N. A. Vigors, Esq. M.P., in the chair. The minutes of the last meeting having been confirmed, the secretary proceeded to read the report, which was highly satisfactory and unanimously adopted. On the motion of Mr. Macleay, seconded by the Rev. John Jennings, Charles

* The note which with the Germans is called H, is the B of English notation.

† This choral is omitted in the French edition, and we have never been so fortunate as to see a copy of it. How much have we yet to learn of this mighty ruler of tones.

Lucien Bonaparte, Prince of Musignano, Mons. Temminck, and John James Audubon, were elected foreign members of the Society. Mr. Blyth having been called upon by the chairman, delivered a conversational lecture on the uses of certain peculiarities of structure, and premised his observations with the statement, that, having recently been engaged in a work on general Ornithology (now in a forward state), wherein he had disclosed some entirely new views on the mutual affinities of birds, founded upon the aggregates of their agreements and differences, in anatomical, as well as in external characters, he had necessarily examined very minutely the structure of the various types, in doing which he had observed several curious coincidences not hitherto remarked, which, in some instances, he thought had led to the solution of interesting problems in Ornithology. He would commence, however, by calling the attention of naturalists to an interesting particular which he had now for the first time noticed in the magnificent specimen of the Snowy Owl before him: he alluded to the presence of aigrettes, which were indeed so obvious that he was astonished that they had never previously been remarked. He was gratified, however, rather than surprised at detecting their presence, for it beautifully corroborated and confirmed the views which he had before entertained, and often expressed, regarding the systematical position of its genus. Mr. B. then proceeded to comment on a singularity of habit, rather than a peculiarity of structure, observed in the Motmot genus (*Prionites*), with which all naturalists at all conversant with exotic Ornithology are familiar: he alluded to the unaccountable habit of self-mutilation practised by those birds, or the nibbling off of a small portion of the vanes of their two long middle tail-feathers, immediately beyond the extremities of the next pair, leaving, however, the tips barbed and untouched, as also the entire remainder of their plumage. Specimens were exhibited of the bird in moult, wherein the new feathers were entire, and others displaying more or less of the truncation of the web. Mr. B. offered an hypothesis in explanation, but pointed out a similarity of habit noticeable in an Indian group of Magpies—the *Dendrocitta* of Mr. Gould—to the discovery of which he was, curiously enough, led by remarking the resemblance, in general aspect and proportions, of the Motmots to the Coccyzus genus in question. This induced him to examine a specimen of the common *Dendrocitta vagabunda*, when he found, to his surprise, that, although the unserrated mandibles of the Pie were inadequate to cut through the web as was done by the Motmots, yet that the same feathers were so extremely worn by constant nibbling that they might be read through with the utmost facility, which was quite impossible in the other parts of the feather. A specimen was handed round. Mr. Blyth thought that co-observation of the two genera might possibly lead eventually to the discovery of the object of so very anomalous a practice. The protuberance on the beaks of the Hornbill constituted the next subject of consideration. After briefly describing its

elevation, and commenting on the singular exception formed by one species, wherein it attained a medium size, was quite solid, and consequently very weighty, Mr. B. called attention to the presence of eye-lashes in these birds, which, he stated, though of course analogous in use to those of quadrupeds, yet were different in structure, being nothing more than barbless feathers, which were developed and annually moulted like other feathers; and the same, he remarked, held true with the rictorial and supra-nasal vibrissæ of birds, as might easily be seen by examining their condition in a nestling. He affirmed that their presence was of extremely rare occurrence in the class *Aves*, existing only (so far as he was aware) in the *Strigida*, and in the Ostrich and Rena, besides two genera of Insectorial birds, the Buceros (or Hornbill, examples of numerous species of which were exhibited), and in the *Crotophagæ* (or Ani), a South American and West Indian genus, both of which, he remarked, possessed a protuberance on the ridge of the upper mandible. Now it was very clear that the purpose of eye-lashes was to defend the eye from falling particles of dust, &c.; and the only reason he could discern, therefore, why these two Insectorial genera should possess the structure in question, to the exclusion of all others, was that the rostral prominence must be employed for some purpose liable to detach such particles; whence he derived the conclusion that the excrescence was not merely ornamental, as some have supposed, but decidedly subservient to some definite object in the bird's economy. What, however, that use might be, must be left to observation to determine; and it would require, it was added, rather nice discrimination to discover what the intent might be of the various modifications of form which the protuberance underwent in different species. Mr. Blyth added a few remarks on the geographical distribution of the Hornbills, which were restricted to Asia, Africa, and the Oriental Archipelago, to which last-mentioned locality, he asserted, those with a large protuberance were principally confined; which circumstance had given rise to an ingenious *prima facie* suggestion by Mr. Mudie, in the article Buceros in Partington's *Cyclopædia of Natural History*, to the effect that, subsisting, as the members of this genus do, to a considerable extent, on fruit, and the luxuriant forests of those exuberantly fertile islands (the Indian Archipelago) being intertangled in a manner that those of Africa affords no parallel or even approach to, it might be that the prominence in the bills of these birds was designed to divide the flexible vegetation for them, so that they might see and reach those substances on which they feed, which is nearly the same conclusion to which Mr. B. had arrived on reflection upon the co-existence of the protuberance with eye-lashes.

Mr. Blyth remarked on the habit reported of the Ani (*Crotophaga*), to alight on the backs of cattle, and feed in the manner of the *Buphagæ*, as extremely remarkable as occurring in a genus inhabiting a locality where no large ruminants recently existed until introduced by Europeans. He then proceeded to call attention to the

gall-tufts of the Heron and Bittern groups, a tuft of unelastic cottony down, occupying their breast and flanks, the use of which, he believed, had never been explained, but which was sufficiently apparent on a little observation of the habits of the group. A Heron, he stated, might not uncommonly be seen standing, as far as the bare part of its tibia would allow, in water, and it would often strike at a passing fish at such a distance that none but those who had witnessed it could form an adequate conception of; in doing which the body, turning forward as upon a pivot, immersed the breast in water, whence, were the part in question to be bare, as usual in the feathered race, the water would, of course, come extremely cold upon the bird's chest; to prevent which Nature had bountifully provided it with a structure perfectly impervious to moisture, an example of which, taken from the breast of a Bittern, was handed round; and the lecturer remarked that beneath the skin were situate a number of peculiar glands, secreting a powdery substance, which was plentifully diffused over the plumage by merely shaking it, but more especially on the cottony down, which covered the site of its formation; and it was remarked that on rubbing the hand in this down, and then immersing it in water, the latter would roll off without wetting. The pectinated claw formed the next subject, which was treated of at considerable length, and shown, from actual observation, to be subservient to two purposes—one direct, the other, as it were, contingent, or merely arising from the circumstance of its possession. The former was the cleaning of the corners of the mouth (not vibrissæ) from Beetle claws or fish scales; the latter the cleansing of the plumage, to which the analogous but merely expanded and somewhat keen edge of the same claw in numerous other birds was likewise employed in effecting. The suggestion of Mr. Owen (in *Cycl. Anat. Physiol.*) was noticed, supposing that the parasites of those species which were furnished with pectinated claws might possibly possess superior powers of adhesion to those which infest other species. This subject was entered into at considerable detail, as involving a deeply interesting inquiry respecting the mutual relations of the preyer and the prey, the former of which were stated to be *particular*, the latter *general*. If, remarked Mr. B., we take a comprehensive survey of both kingdoms of organised nature as they now exist, it is unquestionably true that the nectar of the flower would appear to be designed, not only to furnish food for insects (which is, of course, a secondary and, as it were, contingent object), but primarily for the purpose of attracting them to settle (to which the glare of the corolla, and perhaps perfumery likewise, seem subservient), that by doing so, and traversing the blossom, they might unconsciously distribute the fertilizing pollen over the stigma; the benefit, in this instance, being clearly reciprocal. To advance another grade; certain other flowers, which do not absolutely require the assistance specified (as the *Antirrhinum*, or Snapdragon), have their blossoms closed against such extraneous interference; yet we perceive that Bees are, seem-

ingly in direct reference to these, provided with the means of *cutting through* these tubes. In this instance, therefore, the adaptation is as obviously not mutual; the structure of the flower displays no reference to the insect, whereas the insect is, consequently, expressly modified to rob the flower by violent means. Other instances were then brought forward, which led to the conclusion that just as we *ascend* (in this instance) to more particular cases, the relation of the prey to the preyer becomes more vague and general, while that of the preyer continues equally explicit; till at length we arrive at preyers such as the *Buphaga* (or Oxpecker), the entire adaptative structure of which appears to be expressly designed for clinging firmly to the hides of ungulate mammals, while the beak is employed in penetrating to, and drawing forth, the larvæ of *Ostuda*, which infest them.

The parasites of all animals, it was contended, may be regarded, of course, as *preyers*; and consequently, in the degree of their speciality, the probability increases of their subsequent introduction to that of the species on which they occur; and, so far as I can judge (remarked Mr. B.), we have at present no reason to assume that species have ever been created in reference to future circumstances, however exquisitely, to the very utmost minutiae, they unquestionably were to the actually existent: for most undoubtedly the ever-progressive changes in the condition of the earth are the appointed means of bringing about their successive extermination, when a new state of things having been gradually superinduced, their presence becomes no longer needed, new races being called into existence to supply their places, more appropriately adapted. Wherefore it was deduced, we may justly conclude that no species is provided with express means of ridding itself of its parasitic annoyances, although instruments that it may possess for quite another purpose may be likewise employed with that intent, of which the pectinated claws which had given rise to this course of argument afforded an example. An amusing speculation of M. Geoffroy St.-Hilaire was then referred to, on the philosophy of final causes, originating in the circumstance of a monstrous Calf, furnished with an additional jaw, situate at the extremity of the under jaw, and the grinders of which occupied its sides and were directed outwards, employing this anomalous structure with great dexterity as a cleaning instrument, insomuch that the exhibitors stated that it was provided with a pair of combs, skilfully combined and marvellously adapted for its use.

Mr. Blyth then launched out into the consideration of such objections as he supposed might be advanced in opposition to the foregoing course of argument, and particularly one to the effect that the adherence of Beetle claws and fish scales to the corners of the mouth was as much a future contingency as the being infested by parasites; which objection he did not conceive to be difficult to meet, as, admitting the axiom that every creature is perfectly adapted for its appointed mode of life and such contingencies as might be supposed to arise *necessarily* therefrom, the adaptation would, of course,

be less perfect than every analogy would lead us to pre-suppose, had they not the means of guarding against such contingencies ; and as a specimen of the sort of contingencies which were provided against, he instanced the beautiful cleaning apparatus of the larvæ of the Glow-worm, a creature that subsists on viscid slimy snails.

With regard to Mr. Vigors's commentary on the use of the aigrettes of the Owl family, which was precisely that bold sort of generalization calculated to advance the *science* of Ornithology, Mr. B. was not prepared to acquiesce in that naturalist's views, and proceeded to point out some anomalies that led to the inference that aigrettes and ears had no mutual relation. He stated that a specimen of the Scops Owl, formerly in his possession, had the aigrettes extremely worn, even to the shaft, which, of course, led to the supposition that they were subservient to some use liable to rub them down. He did not, however, at all comprehend what that use might be. He was not in the least surprised that the often-repeated statement of the Ani settling on the backs of quadrupeds was erroneous, as comparison of its adaptive structure with that of the Buphaga led to the same result. But as these genera had been appropriated, he would mention one particular wherein they agreed, which was the extreme rankness of their flesh, sufficiently perceptible on relaxing their preserved skins, the aroma arising from which was not only equally disagreeable, but exactly similar. Mr. B. subsequently remarked that Mr. Vigors's views of the purport of the caruncles of the Vultures, and also the analogous one of Mr. Bell on the facial membrane of the Horseshoe Bats, did not appear to him to be quite feasible, as he suspected that the senses of smelling and tasting required in every instance a wet or lubricated surface. He suggested this, however, with all deference to the opinion of those naturalists who thought differently.

Mr. Vigors, M.P., having congratulated the Society on the great accession of talent it had gained, alluded to the interesting observations which had been made by Mr. Blyth. He rejoiced that such a Society had been formed, as it would doubtless lead to inquiries highly interesting to ornithologists. Matters in themselves apparently trifling, had conduced to the illustration of great and important results. A hundred times he had found that a research after minor characters which were calculated to escape the eye of common observation, carried out truths highly interesting. The clump of feathers on the head of an Owl, the claw upon their feet, had led to serious investigations, pointing out the aim and end of the functions thus developed, and shewing their adaptations to the great objects of their Creator. The aigrette for instance, in the modification of the greater number of Owls, and the disk of the eye, are peculiarities assigned to them to direct them in their nocturnal researches for their prey. He then commented on the peculiar features of the Toucan and Caprimulgus group, and pointed out the great analogy that existed between raptorial birds and carnivorous quadrupeds. The Vulture preys by its scent, and is furnished with a

fleshy caruncle, which is subservient to its sense of scenting. The Falcon secures its prey by sight, and the organ of vision is accordingly powerful; the Owl by hearing, and that bird is equally remarkable for the complicated structure of its ear, to which the aigrette is designed to collect and confine the sound.

The Canine and Feline race of quadrupeds, Mr. Vigors remarked, also presented similar faculties by which they secured their prey. The next analogy alluded to, was that between the bills of the Snipes and Toucans, the former using it for probing the soft mud; and the latter likewise employing it for probing, but in a different manner. The majority of birds who were cohabitants with the Toucans in the South American Forests, had the elongated pensile nests, suspended from the extreme branches of trees, beyond the reach of Snakes and Monkeys. Nature had however appointed the Toucans to regulate their number, by providing them with a bill adapted for the purpose of inserting in those nests and dragging forth the eggs or callow young. Mr. Vigors then adverted at some length to Mr. Blyth's observations on the pectinated claws of birds, and concluded with an eulogium on that gentleman's valuable information, more particularly as regarded the connection between the eye-lashes and rostral-protuberance of the Hornbills and the *Crotophagæ*, and requested Mr. Macleay to communicate his own personal observations on the latter.

Mr. Macleay then rose and remarked it would be presumptuous in him, after the interesting discussion which had taken place, to add any observations. From his long residence in the West Indies, he had frequent opportunities of studying the habits of *Ani*: it was a bird extremely sensitive of cold, and does not live in captivity, even in that climate, unless kept by a fire; they usually congregated in considerable numbers, like the Tit, and thus obtained additional warmth. On dissecting the bird and closely examining the stomach, he found it contained a portion of animal food. He considered the eye-lashes protected the sight (in the manner stated by Mr. Blyth) when passing through the briars. He then called attention to a highly interesting fact, which he had lately discovered, and which furnished an exclusive definition to the great order of Insesores or Perching birds, allowed on all hands to be a natural group, but which had hitherto baffled the ingenuity of naturalists to define satisfactorily.

The character to which Mr. Macleay had alluded, was one common and peculiar to the Insesorial order, viz. that their young are hatched naked or callow.

Mr. Blyth again rose and stated, the same character had also occurred to him, as Mr. Yarrell and many other naturalists were aware, but he pointed out certain exceptions to exist, as the *Caprimulgidæ* on the one hand, among the Insesores and the Cormorants on the other, which were hatched quite naked, not being Insesores. In the first case, the reason that the *Caprimulgidæ* were excluded covered with down was sufficiently obvious, when we remember

that the birds were hatched on the bare ground without any preparation or nest, in consequence of which no care of the parent could suffice to prevent them from perishing, were they excluded otherwise. Mr. Vigors thought that the *Caprimulgidae* scarcely constituted an exception at all, as they stood at the extreme limit of the *Insessores*.

A general meeting was held on Friday, December the 1st.; Harry Chester, Esq., in the chair. The report of the council announced that the Hon. W. T. T. Fiennes has most liberally offered to place in the custody of the Society during his life, at his own risk, the whole of his very valuable collection of birds; five hundred specimens, mounted in cases. The council had accepted this very liberal offer, and hope that this collection will shortly be exhibited in the rooms of the Society, where they cannot fail to prove highly valuable to the Society by furnishing it with the means of promoting efficiently many of its important objects.

Viscount Boyle, Thomas Barrett Lennard, Esq., the Rev. J. Jennings and F. B. Long, Esq. have been elected Members of this Society.

During the last month the council have not been able to obtain any new specimens for the collection of live birds in St. James's Park. Already, however, it contains a very valuable and full collection of British *Anatidae*. The birds are generally in a healthy condition, and the extent of the water on which they are located enables them to be seen in a natural state; all the more ordinary *Anatidae*, being already procured, the council are anxious to make exertions for obtaining an addition to their stock of rare and unique specimens, and trust that the support of the public will enable them to meet the expences necessary for the purpose.

Mr. Bartlett then made some observations respecting the two species of Gull, viz. the Glaucous Gull and the Iceland Gull, having recently obtained two specimens very much differing in size yet agreeing in every other particular. Mr. B. had in consequence been led to examine a great number of specimens, and found them vary from thirty-four inches in length to twenty-five inches with intermediate specimens, so that it was impossible in many instances to decide which was the Glaucous or Iceland Gull. This being the case, he was inclined to believe the whole of those specimens he had seen, to be Glaucous Gulls, and the bird named Iceland Gull, was in reality a small Glaucous Gull.

Mr. Blyth then proceeded to make some remarks on the close affinity of particular species of the *Mealy Linnets*, and at the conclusion the meeting adjourned to January 5th. The attendance was more numerous than on any former occasion, including Charles Lucien Bonaparte, Prince of Musignano, Dr. Horsfield and other distinguished naturalists.

LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY.

WE have always strongly advocated the importance of provincial scientific associations, as means highly calculated to diffuse more widely the advantages of knowledge, and also to bring to light and develop many a flower that might otherwise "blush unseen." It is, therefore, with the greatest pleasure that we record the establishment of any such institutions and report their success. The proceedings of the Leicester Literary and Philosophical Society, which has been very recently originated, are now for the first time laid before our readers, and the spirit and liberality with which this institution has hitherto been conducted we hope may stimulate other large towns to follow so excellent an example. The environs of Leicester abound in much that is interesting to the scientific inquirer. The insulated granitic and trap rocks of Charnwood Forest, with the vast marine and lacustrine deposits of the carboniferous series lying to the north and west of its anteclineal line, and comprising the extensive coal-fields of Coleorton, Snibson, and Ashby-de-la-Zouch, with the limestones of Ticknall and Breedon, present to the geologist a wide field, both for practical illustration and interesting conjectures. The botanist, too, will find an ample storehouse in the numerous varieties of flowers that adorn the broad meadows of the Soar, or bloom in wild luxuriance on the bolder ridges of Charnwood. The antiquary may find ground for extensive research in the many relics of times gone by, and the spots commemorated for some mighty deed achieved.

The Rev. A. Irvine, B.D., F.G.S., president of the Society, a gentleman to whose zeal and exertions the institution is indebted for much of its prosperity, delivered an Inaugural Address, the substance of which we are happy in being able to submit to our readers, as also some important information communicated by Mr. Lawrance, relative to fossil-remains of the tertiary and secondary formations. During the past session, several valuable papers have been read by Dr. Shaw, and we regret that our space will not now permit their insertion. An interesting lecture was also delivered by Mr. Wood, on Phrenology, and many other useful communications upon general science were furnished by different members of the institution. We hope frequently to notice the proceedings of the Leicester Literary and Philosophical Society, and wish it every success.

Inaugural Address, delivered to the Literary and Philosophical Society of Leicester, by the Rev. A. Irvine, B.D., F.G.S., and President of the Society:—

It is a trite remark that man is naturally formed for society. Scarcely is it too much to say that all his powers, pleasures, and pursuits, are essentially connected with its interests. Living by himself, a solitary individual upon earth's wide surface, he would necessarily become 'a dumb and vile creature,' scarcely more intelligent than the beast of the field. I speak not of the first father of mankind, who

was a distinguished exception, having come perfect from his great Maker's hand, with his bodily form in the fulness of its strength, and his spirit radiant with divine intelligence; but I speak of a man reared from his birth in a lonely desert, though that desert were a paradise; and there is every reason to believe, from the nearest approaches made to such actual experience, that he would be little, if at all, superior to the Ourang-outang of the woods—a pitiable specimen of humanity.

If we turn to the consideration of such forms of society as have, at different periods, existed in the world, it is not a little remarkable that the first great scheme attempted after the flood, by a combination which then embraced the whole human race, was an absolute defiance of the Divine Majesty; for it was an effort to establish their union upon a solid basis, and record it on a lofty tower reaching to the height of the heavens, and defying the power of that Omnipotent Avenger who had destroyed the whole world by water. Their designs were impious, and impiety, in any social body, is ever the harbringer of evil; for it stands as a mark to the vengeance of that All-ruling Power whose laws it has broken, whose authority it has contemned, and who hath declared of the righteous man that "all that he doeth shall prosper; while the ungodly are not so, but are like the chaff which the wind driveth away."

But where the objects of any society are such as those which we profess to pursue, there is good reason to hope that "dew of heaven may fall thick in blessings on it." Those objects are legitimate and good which tend to extend our knowledge and strengthen our understanding, to refine the taste, and improve the heart; and wherever they have been steadily kept in view their pursuit has been generally crowned with success, a generous emulation being excited among the members, aiding one another in their different inquiries, eliciting observations by which mutual information is attained, each contributing his portion to the general fund, and thus accumulating intellectual treasures beyond their most sanguine hopes. Where such societies have sprung up, that region which was formerly as a desolate wilderness has been often seen to flourish like a fruitful field, civilization and refinement being fostered by the breath of genius, learning, and philosophy [as the president amply proves and illustrates by the happy results produced by the operations of the ancient Select Society of Edinburgh, the Royal Society of London, and the Geological Societies of the metropolis and country towns].

Fostered, and strengthened, and animated by mighty minds, Geology has extended her researches far and wide. Into that "reign of chaos and old night" she has urged her daring course, dragging forth to the light, from the secret recesses of remote ages, and from the dark bowels of the earth, the wrecks of former worlds, plants of unknown growth, with animals that have lived and moved in earth, in ocean, and in air, at periods beyond the reach of human calculation; all bearing with one unanimous voice this harmonious testimony—

"the hand that made us is divine." Hence have arisen interminable myriads of proofs of the wisdom, power, and goodness of the great Creator and Governor of the universe : and thus it is that, even from the remotest ages, every thing in Nature, when rightly interpreted, accords with the language of Revelation, impressing the mind with ever-new delight, in contemplating the wondrous works of Him who "made the heavens, and the earth, and the sea, and all that is therein." If, then, there be any truth in the prediction, that the future progress in science will henceforth be effected by the joint operation of many, not by the towering genius of one, surely that conviction should incite every one of us to bring hither his voluntary contribution—to cast his small pebble on the hill of science—to supply one little drop to the ocean of its immensity.

It is with such a hope that I would now more particularly refer to the establishment of this Philosophical and Literary Society ; and you will bear with me, I trust, while offering a few observations upon our own particular case, that we may thus not only have our minds cheered with the anticipation of many advantages likely to accrue, but may likewise be zealous in gaining proselytes to the cause of science, by communicating our views to others, striving to enlist them in the same pursuit, soliciting them to the delightful task of co-operating in the advancement of truth, and feeling, also, that the genuine philosophic spirit is ever that of the pure philanthropist. Knowledge, when imparted, is then only enjoyed, and enjoyed in proportion to the extent to which it is imparted.

The two principal advantages, then, are, *first*, the formation of a better taste in a town devoted chiefly to mechanical pursuits, little connected with either literature or philosophy in general ; and *then*, the diffusion of a more friendly feeling among all classes and sects, who have, at present, no common bond of union, but are too much separated from each other, both by political and religious differences.

1. The formation of a literary taste, in a town so little accustomed to cultivate either literature or philosophy, strikes us at first sight as extremely difficult. But because it is difficult, let us not, therefore, desparingly regard it as impossible. "It would be easy," says Polybius, "to shew by instances, that many things, which appear in the beginning to be not only difficult but absolutely impracticable, are, in the course of time, and by continued use, accomplished with the greatest ease. Among numberless instances, the art of reading may be mentioned as one of the clearest and most convincing proofs of this remark. Take a man who has never learnt to read, but is otherwise a man of sense ; set a child before him who *has* learned, and order him to read a passage in a book. It is certain that this man will be scarcely able to persuade himself that the child, as he reads, must consider distinctly, first, the form of all the letters ; in the next place, their power ; and thirdly, their connection with one another—

for each of these things requires a certain portion of time. When he hears him, therefore, read four or five lines together, without any hesitation and in a breath, he will find it very difficult to believe that the child never saw the book before. But if to the reading some gesture should also be added—if the child should attend to all the stops and observe all the breathings, rough and smooth, it will be absolutely impossible to convince the man that this is true. From hence, therefore, we may learn never to be deterred from any useful pursuit, by the seeming difficulties that attend it; but to endeavour rather to surmount those difficulties by practice and habit." The practical lesson thus suggested to us is of the very highest importance, and is calculated to inspire us with new confidence and vigour in the acquisition and cultivation of intellectual habits. A taste for refined mental exercises, even where it may not exist in the individual mind itself, may be powerfully influenced and strengthened by instruction, by imitation, by friendly intercourse, and by various other adventitious circumstances. Again, there are numberless minds in which the seeds of such taste, though abundantly sown, never germinate; partly through unconscious indifference, and partly also from a total want of opportunity to cultivate the habits by which it is to be matured, or of an attention entirely devoted to other occupations. Now, in instances such as these, much may be done to awaken those dormant powers, and to remove the obstacles which check their expansion. By an amicable collision of ideas between man and man it may be found possible to attract the attention of the man of uninformed mind to a new class of pleasures, to allure him into that track of observation and study which may terminate in the refinement of his taste, and enlargement of his views, and expansion of his understanding. Instances have frequently occurred of individuals in whom, even at an advanced period of life, this improvement has been wrought to a wonderful degree. In such men, what an immense accession is made to their best enjoyments! Awaking as if from a trance, they luxuriate in a new existence. Those intellectual objects which they had utterly disregarded now call forth the utmost energies of their mental powers, and they feel a double transport, while, looking back upon the blank region of the past, they partake of the present with as keen a relish as they anticipate with delight the distant and the future. Such are the high gratifications experienced by the man who, after having consumed in low occupations and grovelling amusements the prime of his days, is at length enabled to shake off the shackles with which he was bound, and walk forth in all the blissful sensation of a renewed existence.

As excursions into foreign climes animate the attention, excite the curiosity, and improve the taste of the traveller, so do these surveys of the regions of intellect spread a brightness and a beauty over the scene of our contracted duty and our daily toil. Without some such awakening cause, how many slumber on through the whole of life, and go down to the grave with faculties unimproved; having wasted

all those diviner powers which would have exalted them in the scale of thinking beings, and would have stored their minds with choicer treasures, and conferred upon them far higher happiness, than all that riches or grandeur can bestow. I speak not here of that portion of the humblest classes which is utterly devoid of education, with all its refinements; to them such enjoyments must necessarily be rare indeed, being, in general, far beyond their reach. They, therefore, indulge their appetites with avidity; and, unless impelled by the ennobling influence of pure religion, they seek no higher happiness. A remedy for such defects has been attempted by establishing, for the improvement and instruction of those whose situation in life has precluded them from the attainment of such advantages, Mechanics' Institutes; which, by a strict adherence to their object, under wise regulation and judicious management, can hardly fail of accomplishing their purpose, and conferring essential benefits upon an extensive class of the community. But I am now speaking of men destined for the higher and more independent walks of life, who are too often led, by ignorance of their own possible attainments, to cultivate only a small corner of the mental field, and to abandon, as an unprofitable waste, "by far the most valuable portion of that intellectual inheritance to which they were born." They thus lose all those expanded views of Nature and Nature's charms which, to the eye of the un instructed, are wrapt in thickest darkness, but rise prominent and conspicuously beautiful to the view of him whose intellectual vision is "purged of its film," and who, by the aid of physical science, discerns, as it were, all the secret but perfect mechanism by which she produces such astonishing effects. Such was the heightened charm imparted to that most splendidly beautiful object in the inanimate world—the rainbow, by the new and clear comprehension of the Newtonian theory of light and colours, so exquisitely described by the most philosophical of poets, Akenside, as the result of his own personal experience.

From proofs, such as these, we may, therefore, fairly conclude, that whatever tends to diffuse these sun-beams of intellectual delight over our existence as a town, is a blessing, an inestimable blessing. And if such be the possible or rather probable effect of this Society upon its members, and upon all who come within the sphere of its influence,—if, by the endeavour to instruct others we improve ourselves,—if, by an amicable collision of opinion, we sharpen intellect or refine taste,—if we gain the valuable habit of contemplating, with patient care, any interesting object presented to our observation, and are enabled not only to view it in a philosophic light, but also to portray it in clear and faithful colours, we shall thus have acquired that which will give vigour to our conceptions, perspicuity to our language, and throw over the whole of life a polished grace and inexpressible charm. For we thus learn insensibly to view the objects whether of nature or art, with the eye of perfect intelligence, spontaneously though unconsciously, blending with what we see "all that

we know and all that we feel," incorporating all the beauties of external nature with the very essence of the soul, thus rendering the material world subsidiary to the spiritual, while it contributes to the power of the imagination and to the improvement of the heart.

Leicester, hitherto, has possessed no such advantages. It has, indeed, occasionally numbered some distinguished individuals among its inhabitants, but "few and far between." To associate with enlightened men is indeed a singular luxury. Never shall I forget the intense interest with which, for several years immediately before my coming to Leicester, I frequented the monthly assemblage of the Geological Society of London. In the midst of my laborious scholastic occupations, I hailed that meeting as a rest and refreshment, where I could for some hours enjoy the converse of men of enlarged and cultivated minds, and hear "their speech distilling as the dew," with thoughts calm and copious, bright and new as the fast-falling snows of winter, while elucidating subjects, dark indeed and impenetrable to inferior minds, but open as the day to their penetrating glance, and by them expanded also to the view of others, at the touch of their magic skill.

If here we can, even at a long distance, follow their steps, it will be a delightful consummation. Heaven grant, that this our Society may become an honor, a blessing and a delight to all that frequent it! This fervent wish affords some better hope of accomplishment, now than heretofore, if you reflect upon the widely increasing prospects of a liberal education that have opened upon the town within the space of the last year. Two large Proprietary Schools have been projected, of which one is in process of erection, the other is already built, and flourishing beyond our most sanguine expectation. Doubtless these large establishments will not only send forth many young candidates for admission to our Society, richly imbued with classic lore and mathematical science, but one of them has already brought within our circle men eminent for their attainments both in literature and philosophy, two of whom, I rejoice to say, have already enrolled themselves amongst us, and will doubtless prove themselves most able and efficient members of our body. Under all these auspicious circumstances, are we not justified in hailing the approach of a far brighter day than has ever yet dawned upon us? or rather, may we not turn our hopes for the future into exultation at the past, and congratulate ourselves on the light of taste and intellect so recently diffused through this town and neighbourhood, by the Essays that have been read in this Society, and of which those that have been given to the public, have been welcomed with the warmest approbation.

2. The other peculiar benefit likely to be derived from the establishment of this Society, is the extension of a more friendly feeling among all classes and sects, who at present have no common bond of firm union, but are too much separated from each other both by political and religious differences. It is our happiness to live in a land,

where Civil and Religious Liberty sits triumphant on her throne: Long may that throne be established in wisdom and supported by prudence! Never may its foundation be subverted, or moderation, its best support, withdrawn! Never may it be levelled in the dust, either by the despotism of one, or the licentiousness of many! May it be lasting and immovable as our island itself, baffling the storms of faction, as Britain "*baffles with her hoar cliffs the loud sea-waves.*"

Allow me for a few moments more, to make an observation connected with the future welfare of our Society. In the term Philosophical, is legitimately denoted not only Moral but likewise Natural Philosophy, including also Natural History, which comprises some choice treasures that address themselves not to the ear, but to the eye. Do you then think that it is possible for us, by our combined energies, to form a collection of such treasures? The soil on which we daily tread is not quite devoid of minerals. Witness the beautiful mines of Gypsum, quite in our neighbourhood. The Coal-mines are near, and no stratum is richer in geological treasures than the carboniferous limestone. Barrow is also within a few miles; and we have abundant evidence, that there, in the olden time, have been "creeping things innumerable;" while that splendid antediluvian the Ichthyosaurus, has disported himself abundantly with his fellows, in the quiet waters which then surrounded it. Burrow Hill is also rich in stores of another stratum; and I might point out many other productive spots quite within our reach. But above all, our own beautiful Forest, modestly rearing, with primitive dignity, its granite-crowned head from the centre of the earth, abounds in geological interest; and I scarcely know a more exquisite luxury, than to inhale the healthful air, on a bright sunny day, while engaged in scientific research, on the summits of those breezy hills.

Shall we then begin a collection? That is the point which I would now earnestly press upon your attention. If you are convinced, that such a concentration of materials would be of no less ornament than use to our district, I would add with pleasure, that my own very limited collection of specimens, mineralogical and geological, shall be most cordially presented to this Society, in the hope that it may form a nucleus, round which a variety of interesting and more valuable stores may be collected. The gift will be really no sacrifice to me. For, I had immense pleasure in making the collection many years ago; but except the gratification of shewing its contents to an occasional friend, with me they are actually useless; and my imperative duties leave me so little time to attend to them, that their very names are fading from my memory. If you thus kindly accept them, and they should generate in any individual a love of inquiry, or stimulate research, I have my recompense.

There is only one other remark that I would add, namely, that if we would harmonize, refine and adorn our philosophy, particularly if we would successfully extend our researches to Botany, or some other departments of Natural History, we must pay our court to

the softer sex. Assistance has been often no less graciously afforded than thankfully received by most distinguished philosophers; nor is it presumptuous to hope, that it may in a similar manner, be kindly accorded to us, should we strive earnestly and faithfully to shew ourselves worthy of their protection. Should this eventually prove to be the fact, whilst we are ever ready, as individuals, gratefully to acknowledge the salutary influence which they shed over every condition of life, whether of prosperity or adversity, heightening all our joys, and soothing all our sorrows; as a Society, devoted to the contemplation of whatever is found to be interesting, excellent, or wonderful, throughout the regions of universal nature, we shall here tender our united homage of respectful admiration to "the fairest and best of all God's works."

A most interesting communication was made by Mr. Laurance upon some remarkable specimens of fossil fruits and plants, recently found in the coal formation of Lancashire. After a few preliminary observations, Mr. L. proceeded to describe the specimens which he said formed the most interesting illustrations of a delightful branch of the study of those extraordinary changes which the earth, its climate, its inhabitants, and productions have from time to time undergone at remote periods of its history. They tell a tale (he continued) of novel and astonishing import—a tale which, until these latter times, would have challenged universal incredulity—that the earth abounded with fruits—

"Herb yielding seed,
And fruit-tree yielding fruit after her kind,"

which man too fondly regards as created solely for his sustenance, a thousand ages ere he became its denizen—a tale told in language so unequivocal that it could not be mistaken. The whole mass of the earth, in fact, or at least that portion of it which comes under our observation, the outer crust of our planet, may be regarded as a vast *hortus siccus*, of which every stratum is a page. We drain a stagnant lake, and find in its bed, where the water had rested for ages, timber still rooted and undecayed. We excavate the peaty soil of fens, and turn up a venerable Oak, or nuts, or leaves, or acorns, or some other vestige of timber where no wood now adorns the surface of the country. The sea recedes, and exposes beneath its beach a sub-marine forest; or an extraordinary tide sweeps out an estuary, and from its sandy bed majestic trees thrust out their scathed arms, or exhibit their branchless trunks in the attitudes in which they vainly resisted the overwhelming element. Now we delve into a sandstone quarry, and our operations are impeded by the interposition of the siliceous stem of some patriarch of the primeval woods—a gigantic Pine laid prostrate in the quarry; or perhaps, enclosed between the sandy laminæ, we discover some delicate specimen of its foliage, the anatomy of its leaves preserved and imprinted upon the unyielding stone with a precision and beauty which

the most skilful herbalist vainly attempts to imitate. Or, again, an incoherent cliff on the banks of the Medway, undermined by its action, has slid into the water, and behold! the face of the dissevered mass of clay is hung with clusters of fossil fruit, of which the celebrated *tertiary* beds of Sheppey are so prolific. The date of Africa, the cocoa-nut of the tropical islands, the bactus of America, the areca of Asia, and a hundred species of aromatic and other inter-tropical fruits are here seen with a semblance of reality which, like the celebrated painting of Protagoras, might invite the birds to taste. But we are about to penetrate into the dark recesses of the earth in search of Coal. Here is a vast homogeneous red rock, composed of minute atoms of silicious matter, closely compact, and almost crystalline, through which to pass: though deposited slowly and without violence, it has enclosed no relic of the vegetation the *flora* or the *sylva*, of an adjacent continent or island, from the waste of which its mass is derived. Here and there a group of vegetable forms is met with; but they are "few and far between," like oases in the sands of Egypt. The red sandstone is, indeed, a great Sahara in Geology—it is a blank in Nature's fossil Herbarium. Having traversed this, by a sudden transition we arrive at the coal formation—a mass of consolidated mud, vegetable *debris*, and oceanic land, of an extent and aggregate thickness which almost exceeds belief, yet throughout regular in its alternations, uniform in character, and rich in fossil treasures, every layer enclosing some relic, more or less perfect, of a vegetation to be sought now in more genial climes. Here our *herbarium* is truly *rich* indeed. Lastly, we visit the slate quarries, or the limestone rocks adjacent, which belong to the transition period in Geology; and here misshapen vegetable forms, to which the eye is not accustomed, attract attention and invite speculation. They are the *Algæ* and the *Fuci*—the vegetation of the "hoary deep."

"The dark illimitable ocean without bound,"

whose heated and turbid waters at this early period were replete with organized forms resembling those now existing in the equatorial seas. This is the last page in our *hortus siccus*; but the rapid glance we have taken of its contents will hardly suffice to render intelligible and interesting the facts which the specimens under review elucidate.

It is to three distinguished naturalists, pursuing simultaneously their labours in this novel domain of science in different countries, that we owe the rapid advancement of our knowledge on the subject of fossil Botany—Adolphe Brongniart in France, Count Steinberg in Germany, and Professor Lindley in England. Each succeeding publication of the respective authors embodies some fact unknown before, and exhibits occasionally some phenomenon at variance with the pre-existing theory, and upon minor points the authors sometimes differ in their conclusions: but this is a leading generaliza-

tion from their discoveries, in which they all agree, and which each succeeding fact tends to confirm—every specimen brought to light to illustrate; that a law, corresponding with that which characterizes the animal remains entombed in the earth, marking successive and distinct races adapted to the climate and condition of the earth at different geological epochs, prevails throughout the vegetable relics dispersed through the various strata of which its crust is composed. Not indeed that there is established a progressive development of organised forms in the vegetable kingdom, from simple to complex structure, from acotyledonous to monocotyledonous and dicotyledonous plants, from the humble Lichen to the lords of the forest—"a gradual perfection of organization going on from the remotest period to the latest geological epoch," as M. Brongniart and others have contended—but simply this, that certain tribes of vegetables are found to characterize certain strata, either exclusively or in greater abundance than other strata, indicating the prevalence of those races on the spot at the period of the formation of the rock in which they are embedded. Moreover, and this is the result, singular though it be, which might have been anticipated from the discoveries of Cuvier in fossil Zoology, that the types of *the existing* vegetation are to be found only in the higher or more recent strata, and that in proportion as we recede from the newer to the older formations, the fossil vegetables assume less and less the form of existing species. But although numberless species, genera, and even whole tribes of plants, which have long since ceased to exist in any part of the world, are found in succession as we penetrate the earth, it must not be inferred from hence that monstrous and anomalous forms present themselves, with which the botanist is unable to grapple, exhibiting a departure from the laws manifest in the existing creation, disturbing the harmony and upsetting the order found to prevail in every department of Nature's works. Every specimen, however eccentric its species, however misshapen and uncouth its form, may be referred to some of the recognised families of the vegetable kingdom, although now, perhaps, for the first time exhumed from the depths of the earth, and ten thousand ages have elapsed since it saw the light of day which gave it life and luxuriance. As the traveller who circumnavigates the earth or explores lands hitherto untrodden by human feet, finds everywhere the same order of things, though under a different aspect; so the geologist, however deeply he may penetrate into the earth, discovers only new proofs of the uniformity of the laws pervading Nature. He turns over, in fact, only another leaf of the volume of the Great Author. Now, the specimens of fruit on the table, which have been disinterred from a sandstone quarry in Lancashire (near Bolton), are evidently very dissimilar to any production of the soil and climate of the district whence they were obtained, at the present day: but the most uninitiated will at first sight discover in them some resemblance to the fruits which he has seen imported from the West Indies or South America: and the first inference which he would na-

turally draw would be a correct one—namely, that in the environs of Liverpool once grew the fruits which her ships now bring from the tropics, although he may be unable to account for the circumstance. Thus our proposition is illustrated. There is, perhaps, nowhere existing upon the earth fruit of precisely similar species to those under review, and until within a very recent period they had never been seen in a fossil state: but Professor Lindley pronounces them at once to be the fruits of some species of Palm analogous to the Date. The species is probably extinct, but with such confidence is their family alliance recognised, that they become the basis of very important conclusions.

One of the proofs of the high temperature of the earth at the period of the formation of coal, was supposed to be the occurrence of this tropical plant among the vegetable relics which accompany it in such profusion: but this appears to have rested merely upon the assumption that two or three doubtful species of leaves belonged to the tribe of Palms. Indeed Brongniart entertained the opinion that no decided trace of the palm-tree had been discovered in this formation. Abundance of specimens of this class of vegetation; be it observed, are found in the strata of later periods. They pervade, indeed, all the rocks in greater or less number, from the ancient carboniferous series to the latest tertiary deposits. Like the Pelasgi in human history, you find them at the early periods *existing everywhere but springing from nowhere*. The discovery of these most interesting specimens will, it is supposed, clear away the obscurity in which their origin was involved, and this circumstance whilst it adds to their interest and value, illustrates in a curious manner the progress of science which had anticipated nature and stole a march upon discovery. It was so with another very remarkable order of fossil relics belonging to this period—the *tree ferns*, whose existence had been suspected and predicted long before it was established. When Lindley and Hutton published the first volume of their “Fossil Flora,” “there had not been described a single genuine tree-fern-stem from the coal of any part of the world;” now the existence of three English species has been demonstrated.

Singular as it may appear, the analogy between the grouping of the existing vegetation of the earth and the dispersion of these inert organic ferns beneath its surface—between the geographical and geological distribution of plants is so obvious and striking that these conclusions, established by subsequent discoveries, were strictly within the limits and in accordance with the spirit of inductive science.

But to those unaccustomed to the reception of this species of evidence, the inference deduced from these fossil fruits will appear to be unsatisfactorily established, and the palm-groves of our hyperborean regions will not spring up without a considerable effort of the imagination. This tribe of plants, the *palmares* of botanists, none of which range more than thirty or forty degrees on each side of the equator (thirty-eight degrees in the southern and forty-three de-

grees in the northern hemisphere), and most of which flourish only within the tropics, is among the noblest and most splendid productions of the vegetable kingdom—early known and esteemed by the ancients its very name became synonymous with plenty and exuberance, and attaches still to the city of Zenobia, whilst the majesty of their form and the surpassing grandeur of their port, obtained in modern times from Linnæus the title of princes and patricians of the vegetable kingdom. A well-known palm of Ceylon (the Talipot) is described to be as big and as tall as a ship's mast, the leaves, some of which are capacious enough to shelter thirty or forty men, form a magnificent capital to the trunk, a stately column rising one hundred feet in height. Until the last year of its life it is said to bear no fruit, when, as if the perpetuation of its species appeared to be the end of its creation all the energies of the plant are developed in a crown of glorious flowers—succeeded by fruit, and the tree, as if exhausted by the effort, dies.

Again, the date-palm of Arabia and Upper Egypt, (*Phoenix dactylifera* from Phœnicia having produced the best dates, and *dactylifera*, from the group of dates bearing some resemblance to the shape of the hand,) to which our fossil fruit are allied—a tree of so much value to man that, Gibbon tells us, the Eastern poets have celebrated its 360 uses—has a woody stem, sometimes of considerable thickness and of great length, surmounted by enormous masses of foliage, and for 200 years will continue to bear fruit with the unabated vigour of maturity.

If this, then, were the character of the vegetation of the period of our coal formation—if the earth were then planted with the arboreous trunks, penetrated by the roots and shaded by the massy foliage of the remarkable trees, why, it may with propriety be asked, do we not produce better evidence of their existence, more substantial relics than these the most insignificant, and it might be inferred, the most perishable portions of their gigantic forms?

Were we to turn over the sands of the desert which now surrounds Palmyra, or dig into the alluvium of some neighbouring stream, we might reasonably expect to find many relics of the palm forest, which probably once embosomed that city, overthrown and buried by the tornado or borne down by the torrent. And, indeed, this is the sort of evidence of which we have abundance at the later geological epochs. But up to this moment no palm wood—no leaves, except the doubtful specimens before alluded to—and no other vestige of the palm tree has ever been discovered connected with the coal strata, except the interesting relics upon the table. We may naturally expect, however, that the progress of discovery will furnish us ere long, with more solid evidence, at present its absence is one of the puzzles which geology so often presents.

Now the mass of sandstone from which the fruit was extricated abounds in relics of the contemporary vegetation, vestiges of the most perishable living forms, converted into imperishable rock, their succulent stems now metamorphosed into an unyielding sandstone,

their delicate leaves and soft integument, once painted with verdure, now blackened and replaced with inflexible carbon. The specimens now submitted with one exception, are all common coal plants, but as no palm tree has escaped to tell the tale of their times, they may, although not related, prove useful allies to the fruit with which they were associates, and help to elucidate the obscure question of the origin of coal.

We have here then the *Calamites* (nodosus, I believe), a plant which from its universal prevalence may almost be said to characterize the coal-formation. Whether the coal-measures be sandstone or shale—that is to say whether the deposits be sand or mud the calamites is always present—sometimes standing upright, perhaps in the very mud from which it derived sustenance when living, in which case the stem is cylindrical, but general prostrate and flattened as in the specimens before us. It is usual to refer this plant to the living order Equiseta, and to identify it with the horse-tail of this country, and contrasting its superior size with that of its puny prototype, the horse-tail never exceeding half an inch whilst calamites fourteen inches in diameter have been discovered, it affords a striking illustration of the more-than-tropical luxuriance of the vegetation of the period to which it belongs.

The next specimen is a portion of a flattened and partly decorticated stem of the *lepidodendron*, a genus of extinct plants most remarkable, as constituting a link in the vegetable kingdom which in the existing creation is wanting. Although branched and furnished with bark it was not of the coniferous or fir tribe, having no woody axis. The *lycopodiaceæ* to which it is supposed to bear the greatest resemblance, luxuriates in a hot and humid climate, and hence the occurrence of these lends force to the inference suggested by the *calamites*—that these plants were produced under those conditions.

The other specimens are casts and portions of the stem of the *sigillaria* or tree ferns, about which there has been so much discussion between Professor Lindley and A. Brongniart. Suffice it to say, however, that they are most decisive proofs of an equatorial climate: and that the fossil specimens sometimes infinitely surpass in size their living types under the most favourable circumstances of humidity and climate.

The last is a very remarkable and novel specimen to which the title of *Halonia regularis* has been given, which I believe is all that can be said about it. An uninitiated eye would recognize in it some resemblance to the Cacti or Euphorbiæ of our hot-houses, but it has probably no precise counterpart in the flora of the present times.

There is also a specimen of a striated stem which corresponds with nothing hitherto described.

I could find no specimens of *stigmaria* so common in other districts—as in Derbyshire, for instance, where it is the predominating fossil, and where, singular as it may appear, this cactus-like plant furnishes, in some places, the chief material for the repair of the roads. Nor did I discover any traces of the foliage of ferns in which

other members of the coal-series are so prolific. The aluminous and ferruginous shales (the mud of the coal-formation) appear to have been more favourable to their conservation than the sandy deposits.

Now from these vegetable relics the associates and contemporaries of our fossil fruit (meagre as is the collection) do we not gather important information as to the state of things then existing on the surface of the earth! Is it possible to resist the cumulative evidence which we have here of the high temperature of the earth and the air at that early period in these latitudes?

It would be idle to assert that these enormous accumulations of vegetable *debris* extending over a surface of many hundred square miles, were floated into these northern regions by ocean-currents from their native soil and climate. Masses of timber and other relics borne upon the waves and wafted by the breezes of the Atlantic, will sometimes travel to a vast distance, and thus the productions of the West India islands have been known to reach our shores; but the relics under review are not of these vagrant character. The plants exhumed from the coal formation lived and died in the neighbourhood where they are buried. They flourished and perished (if immutable forms like these can be said *ever* to have perished) in their maturity, uprooted by the torrent and enclosed in the mud of a lake or estuary, or the sand of a sea, ere their fragile stems could decompose or the living fruit had time to germinate. And this process going on throughout a long succession of unaccounted ages (so long and so vast indeed that we are lost in the contemplation of the phenomena which constitute their chronology) produced among others the coal-formation, which alone is sometimes as in the locality to which these specimens belong, 2000 feet in thickness, whilst every member of the series is complete in its fossil character and identity.

Whether these enormous deposits were the effect of river-currents, and floods, and the quiet alternations of sea and land such as we witness in existing nature, or the effect of violent and hostile inroads of old ocean upon *terra firma*, we are not in possession of sufficient data to determine, but the active agency of water, "water everywhere," is manifest in these vast accumulations. The regularity of the strata has been sometimes disturbed by the ejection of molten rock from beneath, and occasionally, as in the instance of the coal-formation under consideration, the whole series has slid down perhaps a thousand feet, the base of the mass having been displaced by some disturbance below in what Sedgwick calls Pluto's kitchen, but to Neptune and his fraternity, the river gods, we owe exclusively the construction of our coal-fields. And yet how few of the spoils of either are discoverable! A single bed of shells, perhaps a few inches in thickness, or a solitary skeleton of a fish may be the only vestige of the watery domain throughout an extensive coal-field. The general absence of marine and fluvial remains from this formation is indeed remarkable. We know that the water was not destitute of these organized beings, for at anterior, and subsequent

epochs it teemed with life. Some chemical condition unfavourable to their preservation must have operated in the earthy matter which enveloped them:—a strange condition indeed which permitted solid matter to be dissipated and not an atom of the soft and succulent vegetable to perish. The carbonate of lime of the shell—the phosphate of the skeleton—and even the siliceous of cercaria and grasses alike yielded to the solvent—the imperishable carbon alone survived. So with the fruits, the shelly envelope has vanished and the destructible portion remains. It may be, as has been imagined, that the succulent plants imbibed the conservative principle from the atmosphere, and there are many circumstances which favor the hypothesis that it was the *office* of the vegetation of that period to abstract from the atmosphere the excess of carbon, and thus whilst the air was being made respirable for man and the animal races who were in aftertimes to inhabit the earth, inexhaustible supplies of that invaluable treasure, coal, were laid up for *our* use in the latter ages of the world.

These, however, it is evident, are secrets of Nature's Laboratory which may never be revealed to us. Science may attempt to imitate, human ingenuity speculate in vain.

There is another circumstance to which I must briefly refer, *viz.* ; the remarkable coincidence observable between the geological distribution of fossil plants and the geographical range of the existing vegetation—a result perhaps the most singular that has attended the study of this subject. It may be thus popularly illustrated, without going into details:—Suppose a traveller to journey from the equator to the polar regions of the earth, he might thus characterize the different scenes of vegetation which distant parallels of latitude, or, better, the isothermal zones would present. He is now under the tropics, surrounded by dense and interminable forests of gigantic evergreens and ever-blooming trees of a hundred species of Palm, Bamboos, Tree-ferns, and Bananas, beneath whose refreshing shade a thousand *Cacti* and *Euphorbiæ* bristle the earth, aromatic shrubs give out clouds of perfume, and high in air hangs the epiphytic Orchis, whilst Cable Canes, hundreds of feet in length, trail along the ground. But he leaves the torrid zone, and grassy meads succeed to tropical jungles; the forests of columnar branchless trees with leafy crowns peering almost to the clouds, and forming so remarkable a feature in the landscape of intertropical climes, diminish into shrubs and gradually disappear, whilst the picturesque forms of the Oak, the Elm, the Chesnut and the Pine—the forest-trees of Europe—now meet his eye. Corn and wine, instead of the bread-fruit and olive, supply his wants; and where the soil is saturated with humidity, instead of Bamboos and Canes, Grasses, Sedges, and Reeds prevail. The Tree-fern has dwindled into an insignificant herb, and other trees, whose foliage yields so delicious a shade beneath a tropical sun, by degrees become dwarfish shrubs and eventually puny herbs. The Orchis leaves its abode in the air, and clings to the soil for support. In higher latitudes the scene undergoes a

still greater change : not only is the luxuriant growth of the warmer regions no longer visible, but the number of species of plants is greatly diminished, until, arrived at the circum-polar regions, the only representatives of the glorious forests of the tropics are the Mosses which vegetate in the swamps, the Lichen which clings to the icy rocks, or the Protococci which discolours the eternal snows !

In the fossil world, the latter scenes have no counterpart, for Geology knows no icy period : but in every other particular the geologist recognizes an epitome of the phenomena which we have described. Beginning with the productions of the temperate climate of Europe, of our own country and times, we trace in succession their gradual disappearance with the animals which have browsed upon the pastures or roamed in the forests. We mark the first advent of the Palm-tree in these latitudes, or rather the last, for we are going up the stream of time ; the herbaceous Ferns give place to the more noble tree, and ere we leave the tertiary rocks the Palm-tree is predominant. In the secondary rocks some new forms meet the eye : the *Cycas* connects the Palm with the Pine, and the Cactus tribes abound—here, indeed we may repose in imagination beneath umbrageous Palm-groves and Bananas, or grope our way through tropical jungles until we are lost in the dense forests of *Sigillaria* and *Lepidodendra*, or swamped among the gigantic *Equiseta* of the marshes of our coal-formation—the rankness and excessive luxuriance of whose vegetation distances all analogy drawn from the present productive powers of the earth !

And it is not through the medium of the imagination alone that this remarkable coincidence may be made palpable to the understanding. A numerical estimate of the relative proportions of prevailing species of plants at different geological epochs, compared with a similar computation of the relative number of species existing under similar circumstances (the same conditions of temperature and humidity being assumed), gives a result which approximates as nearly to the assumed hypothesis as can well be hoped for in the limited state of our knowledge. In reference, however, to this, it must not be forgotten that 50,000 *living* species of plants are recognized by botanists, whilst only 500 *fossil* species are at present known to geologists.

In contemplating the wonderful phenomena with which the subject and specimens before us are connected, it is hardly possible to resist the temptation to speculate upon the cause and the object of these apparent vagaries of Nature : for strange indeed—“stranger than fiction”—are the mighty secrets inscribed in her portentous volume. Perhaps all speculations as to the means employed in the production of these phenomena, may be vain ; but the end accomplished is clear—so clear that it cannot be mistaken. Although these Palm-fruits grew when there was none to eat—although the earth was adorned with beauty when there was no eye to admire, and waste and desolation “joint empire ruled” through many an age whilst “Chaos umpire sat”—has not a great and noble end

been effected? Is there no connection between the triumphs of civilized man and the agency by which our fossil specimens were hermetically sealed up in the sandstone rock? Can we see our streets at midnight illumined with noon-day splendour—our seas traversed by ships in defiance of contrary winds—man outsoaring the eagle in his flight above the clouds, or moving on *terra firma* in cars fleetier than the wind—our comforts and our luxuries ministered to, and our energies multiplied in a thousand ways—and forget that it is to *Coal* we owe all this?

It may be a marvel to us that the earth should have required all this fashioning, and that such a long and elaborate process should have been necessary in the construction of our abode; but the consummate skill of the Great Architect who has so admirably adapted it to our use and convenience, we can never sufficiently admire.

MISCELLANEOUS COMMUNICATIONS.

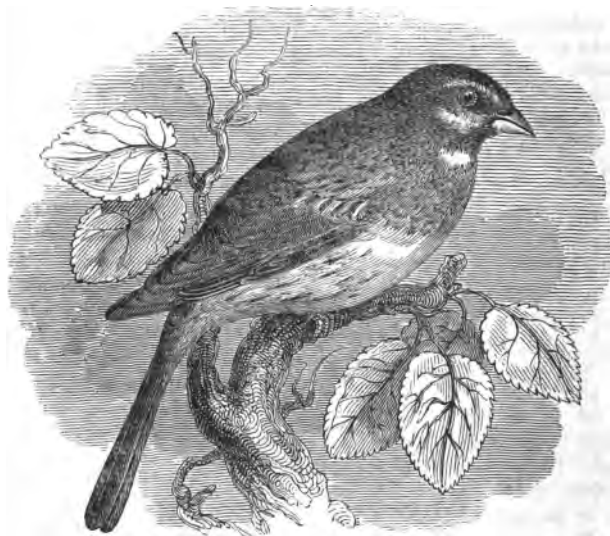
ACCOUNT OF SOME CRANIA FOUND IN THE ANCIENT MOUNDS OF NORTH AMERICA.—Whatever relates to the lost nations of North America is interesting. The fate of a people which occupied the richest part of that country, for an extent of more than a thousand miles, is involved in the deepest obscurity. Nothing remains of their history, and we can gather no ideas of what they were and what they did but from the constructions existing in the territories they inhabited. These works are numerous, and scattered over the country, from the lakes of Canada to the Gulf of Mexico. They consist of regular lines, having considerable elevations and great extent, of mounds or pyramidal eminences, and of spacious platforms of earth. These different works were adapted for fortifications, for places of worship, and for cemeteries. Within the last two years, reports had reached the Atlantic States of very extensive remains of structures, indicating the existence of one or more considerable cities in the territory of Onisconsin, formerly a north-west territory of the United States. The antiquity of some of the numerous works alluded to was great; there are circumstances which would lead one to refer them to a period eight hundred or a thousand years back. The circular and pyramidal eminences seem to have been destined for two purposes—for places of worship and for cemeteries. Some of them contain immense heaps of bones thrown together promiscuously, as after a bloody battle; in others the bodies are regularly arranged, and in some there are only one or two bodies: the bones in the last are usually accompanied by silver and copper ornaments, some of which are extremely well wrought. The crania found in these mounds differ from those of the existing Indians, from the Caucasian or European, and, in fact, from all existing nations, as far as they are known.

The forehead is broader and more elevated than in the North American Indian, less broad and elevated than in the European; the orbits are small and regular. The jaws sensibly prominent, less so, indeed, than in the Indian, more so than in the European. The palatine arch is of a rounded form, and its fossa less extensive than in the Indian or African, more than in the European, owing principally to a greater breadth of the palatine plate of the os palati. But the most remarkable appearance in these heads is, an irregular flatness on the occipital region, evidently produced by artificial means. These peculiarities, with others more minute, give a character to these skulls not found in any living nations. Dr. Warren also stated that he had received other crania, which, at first view, he believed to be of the same race and nation, for they resembled them, in all their peculiarities, more nearly than one Caucasian head resembles another. He exhibited drawings and a cast in proof of the exactness of this resemblance; but these latter, he observed, were species of ancient Peruvian heads. Now the cemeteries of the ancient Peruvians are distant from the Ohio mounds more than fifteen hundred miles; yet the facts stated above rendered it certain, in his opinion, that these nations were connected by blood, and rendered it probable that the northern race, being driven from their country by the ancestors of the existing race of North American Indians, retreated, after a long resistance, to South America, and gave origin to one of the nations which founded the Peruvian empire. Anatomy, also, he observed, showed that there was much resemblance between the crania spoken of and those of the modern Hindoos. And instruments, ornaments, and utensils, have been discovered in the mounds, which bear a great resemblance to articles of the same description seen in Hindostan. The facts stated above lead him to the following inferences:—1. The race whose remains are discovered in the mounds were different from the existing North American Indian; 2. The ancient race of the mounds is identical with the ancient Peruvian. To these conclusions might be added others tending to support existing opinions, but which are hypothetical:—1. That the ancient North American and the Peruvian nations were derived from the southern part of Asia; 2. That America was peopled from at least two different parts of Asia, the ancient Americans having been derived from the south, and the existing Indian race from the northern part of the same continent.—*Dr. Warren, British Association.*

RELATIVE SIZE OF THE YORK AND BIRMINGHAM ORGANS.—Can the Editors of *The Analyst*, or any of their correspondents, inform me positively which is the largest organ, that in York Minster, or the instrument in the Town Hall, Birmingham? I have heard both of these magnificent instruments, but am not myself capable of deciding the matter.—C. BLANCHARD, *Walsall*, Nov. 3, 1837. [Much nonsense has been circulated relative to the point forming the subject of the above query. We feel little inclined to add to the confusion already existing concerning these instruments. A question, in our estimation, of infinitely more moment, is the *quality* of the organs. In this respect we consider the Birmingham organ to be superior to its northern rival. We may add that the inhabitants of York and Birmingham respectively contend, with more vehemence than wisdom, for the supremacy of their own idol.—Ed.]

THE CIRL BUNTING.—The geographic range of the Cirle Bunting (*Emberiza cirulus*) extends to Asia Minor, where, according to Mr. Strickland, it

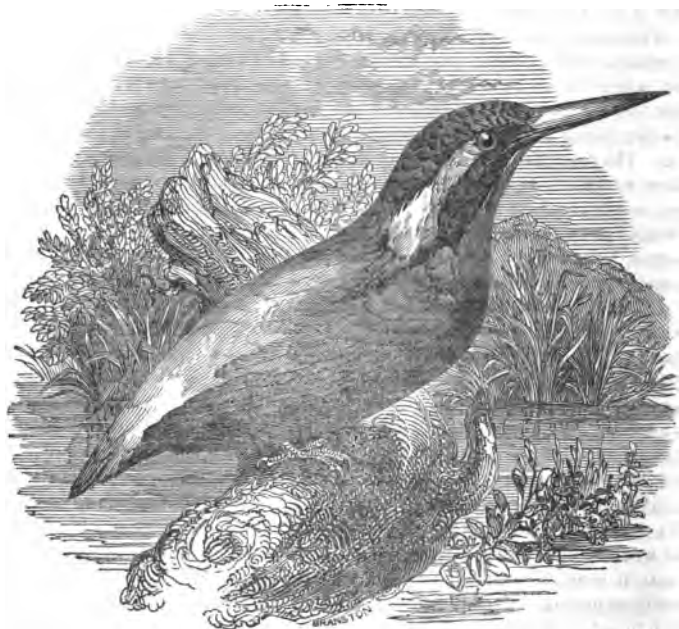
would seem to replace the yellow species, and to frequent the borders of streams and rivulets, which I have never observed it to do in this country. As before remarked, I have constantly found it to affect umbrageous Elms, evincing so marked a predilection for this particular tree that the species might have been named very appropriately the Elm Bunting. I have repeatedly met with it, indeed with several individuals, singing from the tops of a clump of Elms surrounding a farm-house, which, throughout the south of England, is a very likely situation to meet with it.



It is rarely noticed but within a few miles of the sea, and appears to be most abundant in certain districts of the Isle of Wight. Near Chichester, and again at Alton, it is not uncommon : and lately, while enjoying the view from the summit of Selborne Church, I noticed two of them singing in the vicar's garden beneath me, though the species was unnoticed by Gilbert White. Proceeding inland it rapidly disappears, and at Godalming is accounted a rare bird. Now and then a specimen is taken, mostly in winter, by the London bird-catchers, who seem to consider it a prize; but it can only be considered as a straggler near the metropolis. It is sparingly diffused over the greater part of Hampshire, and also, I should suspect, Dorsetshire; but I cannot speak from personal observation to the westward of Hants. It is popularly known in the Isle of Wight by the name "French Yellowhammer," and partially, both there and elsewhere, by the term "Blackthroated Yellowhammer," which are the only provincial epithets I have heard applied to it. The young appear to be extremely hardy; for, during a pedestrian tour, I carried one in a box in my coat-pocket for several days, feeding it on what various fare I could pick up by the way. This bird is now alive and healthy. I captured it near Yarmouth in the Isle of Wight.—*Naturalist for October, No. XIII.*

APPARATUS FOR WITHDRAWING ATMOSPHERIC PRESSURE.—Sir James Murray, of Dublin, has invented an apparatus for the purpose of withdrawing atmospheric pressure, partially or wholly, from the surface of the body. The first of his machines was for the whole body, and resembled, in form, a slipper bath, with the addition of a separate part to cover the upper portion of the body, the head only being free. The upper portion was luted to the lower by means of a composition (used in making printer's rollers for inking the types), and fixed in a groove; and, if necessary, the patient's face and head could be contained in a glass case, luted to the machine in the same manner, and respiration carried on by a tube. The air from the machine was removed by an exhausting syringe, screwed on towards the bottom part of this apparatus. He had tried this machine in the collapsed cases of cholera, and exhausted the air from the body, taking off one ton of atmospheric pressure. The consequence was, that the vessels became full and turgid, and the body, previously shrunk, was rounded and red. He had tried it repeatedly, and the same results followed. The process might be reversed, and pressure of air made on the body, even to the amount of 100 tons without damage; but beyond this it would not be safe. He had tried it repeatedly in asthma. The principle was applicable locally, and parts of the body could be submitted to the action of the machine modified so as to be suitable to them. He exhibited a contrivance of a long tin tube, made air-tight, and with a piece of wet bladder round one end, which was open, and at the other end, which was closed up, a small exhausting air-pump was placed. A patient with a paralytic wrist, put his arm into this; the wet bladder was tied round his arm at the top, to make it air-tight, and the atmosphere was then pumped out of the tube. The atmospheric pressure being taken off, the limb became turgid, the circulation was increased, and the part affected was soon cured. There was another adaptation of the same contrivance to the limbs, to draw off the effect of congestion of the brain; and one to stop hæmorrhage in an injured hand, limb, or other extremity. An exhausting pump was fixed to the end of a bladder, the limb was put into the bladder, and the neck then tied round to make it air-tight. The air was then completely exhausted by means of the pump, which compressed the bladder so close to the skin as effectually to stop even the pores of the skin. The same contrivance of a bladder and exhausting pump was also applied for the cure of ulcerated legs, by preventing evaporation of the ulcers by exhausting the air and making the collapsed bladder adhere tightly all round. For irregular surfaces he thought the instruments of particular value, since no dry-cupping could be used there. If this plan had been known when those melancholy deaths from dissection cuts took place in Dublin, and dry-cupping could not be had recourse to, it would have been fortunate. The machine would be particularly advantageous in withdrawing blood from particular parts to others more remote. Thus, in cases of congestion of the blood in the head, when bleeding had been carried to such an extent that it would not be safe to carry it further, owing to the great general loss in the circulation, blood might be made to accumulate in other parts, as in the legs. The case of a well-known brewer in Dublin was treated on this principle, and he recovered. Sir James has enumerated the kinds of cases where the apparatus might be used; asthma, defective external circulation, aneurism, tumours, and paralysis.

THE COMMON KINGFISHER (*Alcedo ispida*, Linn.).—We have never yet seen a good figure of this bird, and trust that the engraving we now present—executed by an eminent artist—may be considered a faithful representation. All the other figures we have seen of it err in the too great bulkiness of the body; for, although a thick bird, it is not so dumpy as ornithological draughtsmen would have us believe.



A very general opinion prevails as to the scarcity of the Kingfisher in England. This, however, is owing to the shy nature of the bird, and to the small attention paid to Natural History by the majority of our countrymen. The assertion of some, that it is extremely common, is, on the other hand, equally erroneous. The fact is, that it is equally, but rather sparingly, distributed throughout the country, that it may, perhaps, not often be noticed, save by the observing ornithologist. That a bird equalling in the splendour of its plumage the brightest ornithological gems of tropical climes should be indigenous in our comparatively northern regions, is certainly not a little remarkable. The majority of British birds, as almost every one knows, are plainly attired; but the plumage of many of them is, nevertheless, extremely handsome.—*The Naturalist*, vol. ii., p. 386-7.

MECHANISM OF THE MOTION OF GLACIERS.—Mr. Mallet, at the British Association, made it evident that many phenomena of these singular masses had been hitherto overlooked; and, although described by many eminent observers, no solution had been given to the question of their movement but that of their weight, which he showed could have only a partial

operation, as they often rest on rugged beds, and these not always of much inclination. He proposed a very ingenious explanation of their movement by means of hydrostatic pressure, arising from the fact of the lower part of the glacier being of a higher temperature than the upper: this causes a melting of the under part, and a consequent raising of the mass in a perpendicular direction to the earth's surface, while its descent was at right angles to the inclined surface: a progressive motion downwards ensues, following the law of the resolution of forces. He then spoke of certain causes of the rents and fissures in glaciers, these being often convex downwards, owing to the operation taking place in the middle part of the mass, which descends soonest, while the whole is held in its place by the upper and lower extremities: also tubular fissures are formed by blocks of stone sinking by degrees in the glacier, owing to their higher temperature gradually melting the surrounding ice. He then alluded to the singular accumulations of detritus on the glaciers, which are locally termed *moraine*, and are formed by *éboulements* in winter, and covered by the snow. These he found to assume linear directions parallel to the axis of the glacier; and, from the regularity of their arrangements, he conceived it possible to discover the site of old glaciers from the moraine which had remained on the ground after their destruction.

ENCROACHMENTS OF THE SEA.—It is well known that the Baltic Sea, generally speaking, makes inroads upon the surrounding shores; but there was an idea that Prussia resisted these. The researches of M. Domeyko, a Polish gentleman, have, however, proved that this country has shared the general fate to such an extent as to lose a whole province on the borders of the Gulph of Königsberg. Voight, a German writer, and other still more ancient authors, all record that, at the time when Prussia was occupied by the Teutonic order, the province of Vitlandia was granted by them to the inhabitants of Lubeck. But every trace of this territory has now disappeared; it was situated between Billau, Brandebourg, and Balga. Pisanski, in his work on the Baltic Sea, says that the waters constantly advance on the western coast, as well as on the northern coast of Samland; and there is a tradition among the people that some long strips of land, formerly covered with forest, have been thus buried. In fact, the waves still throw up trunks and roots of trees which evidently came from their own soil, now at the bottom of the sea. The ruins of the chapel of Saint Adalbert, formerly six miles from the sea, are now scarcely one hundred paces distant.

GEOLOGY.—M. Tournet has presented a long memoir to the French Academy of Sciences, containing his geological observations in the neighbourhood of Arbrèsle; in these he establishes some well-determined affinities between the nature of those rocks which are known to have pierced through the upper crusts at various periods, as well as their direction, the soil which covered them, and their degree of fusibility, as connected with the period of eruption. M. Tournet thinks that the true and only primordial sedimentary rock is composed of clay slate, and that this rock, which contains the element of mica, being altered or modified in different manners, has been transformed into gneiss, mica slate, and other substances. He admits four modes of alteration: one is calcination, a second trituration, a third the changes produced by penetration and *cementation*, and the fourth is the influence of the granite, which transforms it into gneiss by introducing its felspath when in a state of fusion.

VEGETABLE PHYSIOLOGY.—Mr. Nevan, in February, 1836, instituted some experiments on the physiology of vegetables : they were performed on Elm trees, forty years of age ; and the results were the following :—1. The stem of the tree was denuded, in a circle, of its cortical integument alone, leaving the alburnum beneath uninjured. In the May following, the denuded part was filled up by the exudation of bark and wood from the upper surface of the wound, and the tree had not suffered in growth.—2. The bark and *cambium* were removed in the same manner. In August, 1837, this tree sickened, and there was no formation of wood or bark in the wounded part. Two developments, however, took place, one above the other, from below ; the former having the appearance of roots, the latter were branches with leaves.—3. The bark and two layers of alburnum were cut away. The tree was at the time unhealthy : it, however, put forth its leaves in that and the ensuing spring, but shortly after died. No sap was observed above or below the wounded part. Roots were developed from the upper, and branches from the lower part of the section.—4. The bark and six layers of alburnum were taken off. The tree became much less vigorous, but did not die, and otherwise presented the same appearance as the last.—5. The bark and twelve layers of alburnum were stripped. The consequences were similar to the last two ; the alburnum above and below the cut being dry : but an accidental cut that penetrated into the heart-wood exuded sap.—6. This was a repetition of the experiment of Palisot de Beauvais, by cutting away a circular ring of bark around a single branch. The branch continued to grow, and roots sprouted from the under surface of the isolated bark and branch.—7. In this the whole of the wood of the tree was cut away, except four pillars, composed of bark and sap-wood. In this case, the sap first appeared from above, descending by the pith, and then from the heart-wood, the alburnum being dry. In this case the sap must have passed up the alburnum, and horizontally through to the heart-wood.—Mr. Nevan inferred from these experiments, 1. That the life of the tree does not depend on the liber or cambium, the inner bark or nutritive fluid.—2. A descent of sap takes place before the development of leaves.—3. That new matter arises from below, which had not previously been allowed. He thought there were two distinct principles in the tree ; one the ascending or leaf principle, the other the descending or root principle. He had also performed some experiments on the conversion of roots into branches, and came to the conclusion that buds or branches might be developed from any part of the root above its extreme end, from which point it was impossible for buds to be developed.

FOSSIL REMAINS.—M. Azéma has found some fossil bones of Mastodons and the Rhinoceros, reptiles, and some well-preserved fruits, in the parish of Sauveterre, near the district explored by M. Lartet, whose discoveries we announced some time back. It would be interesting to ascertain whether the skeleton of the new and remarkable Rhinoceros brought from behind the Cape, by the expedition under Dr. Andrew Smith, presents more affinity to the recent or to the fossil species. It seems that the new fact concerning fossil *quadruman*a has been succeeded by a similar discovery in the Himalaya mountains, but which is not so curious as the circumstance of finding these animals in Europe ; and what is still more extraordinary, the comparative anatomists have determined that European species to be similar to those

Gibbons which inhabit the remotest parts of Asia. M. Lartet's discoveries have given rise to much discussion in the French Academy of Sciences, the members of which body do not assign all the remains sent to them to *Quadrumanus*, but ascribe some of them to *Carnivora* and *Pachydermata*. Among other questions, it has been debated whether or not the Gibraltar Monkeys are indigenous to that rock, or whether they are brought by sailors from Africa and then let loose. It would be a remarkable proof of inattention, if, after so many years possession, the English could not solve this problem.

SEA GRAPE.—M. Arago, having expressed a desire for further information respecting the place whence the floating banks of sea-weed, seen off the Azores, originally came, M. Bonnet communicates his observations, all of which tend to the opinion that this weed, which is called the Sea Grape, and is supposed to have been brought by a current from the Bahamas, grows in the place where it is found. He says that, when becalmed and the water has been clear, he has seen detached pieces rise from the bottom in a fresh condition, which may be easily distinguished from those which have been some time on the surface: and M. Bonnet is convinced that, with proper materials, the bottom of this part of the ocean might be reached. This gentleman states that, in one of his voyages, when in $23^{\circ} 26'$ north latitude, and 44° west longitude, the water became quite muddy, and formed a turbid line north-east and south-west, which was half-a-mile broad.

ANALYSIS OF METHODS FOR DETERMINING THE FUNCTIONS OF THE BRAIN.—What are the functions of the brain? The object of the present inquiry is to analyze the several methods tried for the solution of this problem, and to pass a judgment on each. The first method employed was the anatomical: the brain was dissected and its structure examined, in order to determine its functions. But the mere anatomical examination of an organ in the body is inadequate to reveal to us its functions or uses. We may thus acquire a knowledge of its component parts, or some insight into its structure; but something more than merely dissecting the dead is required before we can divine the uses of any part in the living: suffice it to say, that dissection *has not* revealed to us the functions of the brain. This organ is every day dissected; its functions are still a matter of dispute. Some other method of investigation, then, was necessary, and another was tried, which might still be looked upon as an anatomical method; but in this instance the dissection was performed on the brain in the living animal, and hence may be denominated the method by vivisection; this was a step in advance. The effect of injury or removal of certain parts of the brain was compared with the influence thus exercised on the manifestation of function. When a part was cut out, its function could no longer be exercised; and it was agreed that by removing each part in succession the use of each would be discovered. This sounded speciously enough; but the results have demonstrated it to be wholly inadequate. To be able to remove each part separately, we should first know what these parts were; and, then, was it possible to remove one part of the brain without injury to any other part, or such a shock to the whole system as must materially derange every manifestation of function? Besides this method could throw no light on the uses of those parts of the brain which are peculiar to man, and therefore the most interesting and important; but which, not being present in the lower animals, could not be made the subject of such experiments. Accordingly,

we find, that such experimenters not only disagree among themselves, but different experiments performed by the same physiologist contradict each other. Some of the more particular points which have been thus attempted to be established are a relation between injuries of certain deep-seated cerebral parts, and the disturbance of equilibrium in muscular motion. Thus Fodera found that removal of part of the cerebellum was followed by motion *backwards*, but removal of the whole cerebellum caused the total disappearance of the power of motion. Magendie, however, found that a duck deprived of its whole cerebellum could still swim, but only backwards; while division of one crus of the cerebellum in an animal, was attended by the curious phenomenon of a constant rotatory motion of the body on its axis towards the side wounded. Flourens, who was one of the earliest investigators in this line, details many such experiments, and acknowledges a very curious and unexpected result, which, in fact, at once exposes the liability to fallacy in attempting to draw conclusions from such experiments. He found that division of the semicircular canals in the ears of birds (or rather the membranes lining these canals) was followed by abnormal motions, resembling those consequent on dividing certain of the deeper seated parts of the brain; so that the conclusion was irresistible, that these canals had the same right to be regarded as regulators of muscular motions as any parts of the brain, a conclusion obviously absurd, and which could not have followed had the method of investigation been correct. Bouillaud, in instituting experiments of this description, has devoted a particular series to investigating the functions of the anterior lobes of the brain, and although the result at which he has arrived is too vague and general to advance our knowledge much, still it is so far satisfactory as to lead to something like a determinate result, and one that is in accordance with results obtained by other modes of investigation. According to Bouillaud, ablation of the anterior part of the brain was always attended by a state resembling idiocy, the power of discriminating external objects being totally lost, although the faculties of sensation seemed still to exist; and hence the conclusion that the anterior part of the brain is the seat of the several intellectual faculties. Bouillaud was so far fortunate in this experiment, that in removing the anterior lobe of the brain he separated a part which possesses a distinction of function;—but how vague the information imparted—no attempt to locate a single one of “the several intellectual functions,” the seat of all of which is placed in this anterior part. Such attempt, however, must have been vain by such a method, and the amount of information obtained by vivisection must after all be allowed to be but small indeed. Accidents occurring in the human subject, occasionally afford a rude specimen of the result of such method as applied to investigating the functions of the brain in man—but here the result is not only curious, but somewhat startling; for the loss of large portions of brain from the anterior lobes is recorded to have occurred without any disturbance of the intellectual powers. Some remarkable cases, indeed, of injury of the brain are on record, which at present appear inexplicable upon any view of the subject, for they would go, not only to disprove the uses of particular parts of the brain, but the utility of brains at all; but in thus proving too much, they obviously prove nothing. Farther and more careful observations are necessary; in particular, attention should be directed to ascertain whether both hemispheres of the brain be alike injured, as we know that one side

is able to carry on its functions independently of the other. The inadequacy of the vivisectioning method being thus made manifest, we turn to consider another and more popular mode of inquiry among medical men, and that is the pathological method, or rather the study of morbid anatomy as regards the brain. The pathologist considered that by watching the effects of disease as well as injury, and awaiting the result, he would meet with a sufficient number of cases in which particular parts of the brain were diseased, and hence their functions deranged, to be able to tell, by comparing the symptoms during life with the morbid appearances after death, what relation subsisted between the several parts and the functions exercised by those parts. But here again we are met by difficulties somewhat analogous to those which we have seen beset and embarrass the mode of investigation by ablation of parts. There is perhaps a greater chance that morbid action would be set up in one part of the brain, and be confined thereto, than that we should light upon a single organ in our attempts to cut out parts separately, and succeed in removing that part singly, neither more nor less: but how seldom in disease have we its ravages so strictly confined, or an absence of general or sympathetic disturbance involving neighbouring or distant parts more or less. Again, it must depend on the nature of the morbid action, whether the function, even when disturbed, be exalted, diminished, or altogether suppressed; while how difficult is it to determine respecting any individual labouring under severe illness, especially disease of the brain, to what degree any of his mental or moral powers be affected beyond the information to be obtained from his giving rational answers or not, to a few common-place questions. Morbid anatomy is useful in prosecuting the enquiry now proposed, it like everything else, has its proper time and place. Some light had, however, been thrown on these subjects by pathological investigation; and the continued prosecution of the inquiry, with due precaution, would doubtless add still farther to our knowledge. On reviewing, however, what had been as yet actually done by pathology in the way of connecting derangement of function with disorder of particular parts of the brain, but two points seem to have been with any certainty established; and these were the relation between loss of power of utterance and an alteration of the anterior lobules of the hemispheres, and between derangements of the generative system and alteration of one of the lobes of the cerebellum. These statements were originally made by a French author of note. Other relations were said to exist between affections of the extremities, upper or lower, and some of the deeper-seated parts of the brain; but these had nothing to do with the higher functions attributed to the brain, and which he was more particularly considering; while even these relations between the parts alluded to were contradictory of the result obtained by those who experimented on the same parts in living animals. As yet, then, it did not appear that much light had been thrown on the subject by pathological inquiries. The two conclusions pointed out, however, were in accordance with the result of observation made by an altogether different method, and, as far as they went, corroborated the existence and situation of the organs of language and amateness. New facts of course would be thus made out, but as being in itself an adequate method for discovering the functions of the brain, doubts might reasonably be entertained of the efficiency of mere morbid anatomy.

Another set of inquirers now entered the field, who, seeing the disadvantages of attempting to investigate the functions of the brain, by examining that organ in an unnatural or unhealthy condition, proposed to investigate it only in its healthy and natural state; and, by considering its developement, to determine its functions. Perhaps this may be denominated the physiological method; or that, which, by comparisons regarding the size of the organ in man and other animals, sought thus to determine in what man's intellectual superiority consisted. "Man has absolutely the largest brain of any animal in creation, and hence man's intellect is superior." This was a plausible dogma, and had the support of some great names, and much apparent truth; but, unfortunately for those supporting this opinion, it did not prove to be absolutely true, and so, necessarily fell to the ground. Man, in fact, has not the largest brain of all animals—the brain of the elephant and whale being larger;—hence man's superiority to these animals consisted not in the superior size of the brain: well, said others, we see this, and give up that test; but, though man's brain be not absolutely the largest, it is surely the largest in proportion to his body—and this is the reason of his superior intelligence. But this test was less fortunate than the former; for the wren, the sparrow, the canary, and many monkeys, have been found to possess brains larger, in proportion to the size of their bodies, than man; but it has not been proved, though each may be clever enough in his way, that any of them surpass man in intelligence. This mode of comparison not answering, the brain was next compared in size to the spinal marrow, and man was said to surpass in intellect, because in him the brain exceeded the spinal marrow more than in any other animal. Sommering, in particular, supported this opinion, but it is not tenable as matter of fact; there are exceptions, and Cuvier points out the dolphin as one.

The next mode of comparison adopted, was that of comparing the brain with the size of the bones of the face. The larger the brain was in comparison to the face, the greater would be the intellectual power; and hence the superiority of man over all other animals, and even of one man over another; because the size of the brain compared with that of the face was the largest. This sounds silly enough; and yet this is, in truth, neither more nor less than an enunciation of Camper's celebrated "Facial Angle"—one of the most popular, and apparently successful, tests of this kind that has been proposed; and which continues in favour with many physiologists. This angle (as all know) was formed by a line drawn horizontally from the roots of the incisor teeth of the upper jaw, to the opening of the ear, which, being intersected by a line drawn perpendicularly from the same incisor teeth to the most elevated part of the forehead, constituted an angle, the capacity of which was to be taken as the measure of intellect. Now, it happened that, in this mode of comparison, there accidentally existed an element of truth, which accounts for its apparent success in many cases. The perpendicular line, in fact, gave a rude measure of the degree of projection of the forehead, or development of the anterior lobes of the brain, which are agreed upon by all observers, as more particularly connected with the intellectual powers. The more the forehead projected, the larger the angle would become—hence the apparent truth of the test;—but, on a closer view of the subject, it will not bear examination. The facial angle of the infant is greater than that of the man, (as 90° to 86° , according to Cuvier)—hence the infant should have

superior intelligence. The facial angle, in nearly three-fourths of the lower animals, is, according to Blumenbach, the same; yet how different are these animals in their various degrees of intelligence! But it is unnecessary to dwell upon the incompetency of methods of investigation, which took the whole brain for a single organ, and made that the organ of intellect as a single mental power, and then attempted to establish the relation between the two, by comparing the brain with something between which and the brain no necessary relation existed.

A new observer now appeared in the field—a man rarely endowed with the power of observing facts and thinking for himself—a close interrogator of nature, and a strict adherent to the inductive method of investigation. This was the celebrated Dr. Gall. In attempting to investigate the functions of the brain, he did not look upon it as a single organ exercising a single function; but, regarding it in its natural condition as a congeries of organs, or collection of parts, he endeavoured to determine the use or function of each, by comparing the developement of one part with that of another, in the same brain, taking size as a measure of power. The result of his observations was, to lead him to the conclusion, that the intellectual organs, or the parts of the brain by which our intellectual powers are manifested, have their seat in the anterior lobes of the brain: the organs of the moral powers are situated in the superior parts; while the lower propensities or passions, which we share in common with the inferior animals, have their seat below and behind.

The line of investigation pursued by Dr. Gall, in endeavouring to discover the functions of the brain, was free from many objections that held against other methods; and, being in itself good, could not but lead to good results. This was a physiological, not a phrenological question.

NOTICES OF BOOKS.

L.—Views of the Architecture of the Heavens; in a series of Letters to a Lady; by J. P. Nichol, LL.D., F.R.S.E. Professor of Practical Astronomy in the University of Glasgow; 8vo. pp. xij., 226; Edinburgh, London and Dublin, 1837. Dr. Nichol's object, in these Views, is—"to state what recent times have evolved concerning the vastness of the Universe," in simple popular language. This subject is properly distributed into three distinct parts under which he treats successively of—the Form of the Existing Universe, of the Principle of the Vitality of Stellar

VOL. VII., NO. XXII.

Arrangements, and of the Origin and probable Destiny of the present Form of the Material Creation. He then adds Notes on the planetary system, on the orbits of double stars, on the geological changes, and on the exact places of the more important objects represented in his plates. These are thirty-two in number, and their execution is so perfect that, in most cases, they will amply compensate for the want of powerful telescopes. Dr. Nichol's Views, in aim and accomplishment, merit the highest commendations: their "*Nebular Hypothesis*" will conduce effectually to the

YY

solution of not a few hitherto unsurmountable difficulties both in Astronomy and Geology.

2.—The Tourist in Spain and Morocco, by Thomas Roscoe; illustrated from Drawings by David Roberts; 8vo. London and Paris, 1838; pp. xij. 292; embellished with twenty-one engravings. This volume constitutes Jennings' *Landscape Annual* for 1838; it closes the series upon Spain, and embraces some views in Morocco—two countries closely associated in their history and vicissitudes, and their influence upon other nations: and, in addition to former recommendations, it contains a greater variety than its predecessors, both in regard to country and to the character of the plates, as well as to the costume, manners and grouping of the subjects. It concludes with an exceedingly graphic view and description of *Constantina*, so lately the bloody scene of battle and brutality. Those who relish this sort of Literature, will be gratified with the vivacity of Mr. Roscoe's descriptions and philosophy. The Gate of the Hospicio at Madrid, the Interior of the Cathedral of Seville, and the Vestibule of the Treasury, at Tangiers, may be specified as picturesque illustrations of genuine *Landscape* scenery. Portugal, under new arrangements, will form the next volume of this "Annual;" the present rivals all the former ones; and it is equally deserving of the liberal patronage, with which the work has invariably been received.

3.—The Oriental Annual for 1828; or Scenes in India, by the Rev. Hobart Counter, B.D. with twenty-two engravings from drawings by William Daniell, R. A. 8vo. London, 1838; pp. 242.—This volume is of a more miscellaneous character than those of the "Oriental" which have preceded it. The Tales in the Text are well told: the Plates are beautiful; they are distinguished by an uncommon softness, richness and individuality. Among them, the Zoologist will find the "Fretful Porcupine" for a subject on which to ponder: the portrait of a Malabar Hindoo, with an "immense expansion of forehead betokening a mass of brains," might form a fair theme for phrenological con-

templation; and, in the Mausoleum of Humayoon or the Minar at Futtepoor, or the Mausoleum of Nizam-ud-Deen Oulea, the architect will discover a "Study" admirably calculated to create a spirit of emulation and wonder. There is a fine fresh "Scene" representing a Female Peasant of Ceylon, the heroine of a Tale replete with romantic horrors. The *Scenery*, outside and inside, of this "Annual" is exquisite.

4.—A Dissertation on the Causes and Effects of Disease, considered in reference to the Moral Constitution of Man, by Henry Clark Barlow, M.D. 8vo. A. & C. Black, Edinburgh; Longman, London, 1837; pp. viii. 79. This is a new version of the author's Inaugural Dissertation, set forth at the time of his obtaining the doctorate. It was then received in a "very flattering manner" by the Medical Faculty of the Edinburgh University, and it is now published in the hope that "by thus endeavouring to point out the true Philosophy of Disease, some addition might be made to the great argument for the power, wisdom and goodness of God, as manifested in the creation. The spirit of this dissertation is modestly indicated in its motto from Lord Bacon, "Thy creatures have been my books, but thy Scriptures much more." We like Dr. B.'s principles for the most part, and greatly respect the object of his essay: we may examine them analytically, on a future occasion.

5.—The Transactions of the Provincial Medical and Surgical Association, instituted in 1837. Part I., Volume vi.; 8vo. London, 1837; pp. xij. 122.—This volume comprises an account of the meeting and proceedings of the Association at Cheltenham, in July 1837; the Retrospective Address by Dr. Bardley of Manchester, and Observations introductory to a Plan for the Reports of Hospitals, by Dr. Cowan of Reading, to which the Objects and Laws of the Association are subjoined. Prefixed to this *first* part, is a coloured figure of a monstrous child: the *second* will be published in the spring. Let this Association persevere in pursuing its objects, as these are every way excellent; and, in successfully attaining

these objects, it will extinguish the inflammatory efforts of all those firebrands who may exert a malicious activity in struggling to kindle the flames of dissension among its members, as the sure means of consummating the degradation of an honorable and benevolent profession.

6.—A First Grammar of the Latin Language, designed for Schools or private tuition; by the Rev. W. Butler, M. A. Head-Master of the Grammar School, Nottingham: 12mo. Nottingham and London, 1837; pp. 128.—Mr. Butler's object, in this little work of his, is to supply what he considers to be a desideratum both with schoolmasters and private teachers—a "FIRST GRAMMAR of Latin, at once *plain* in language, *accurate* and *precise* in definitions and rules, and *sufficiently comprehensive* in its plan," to guide the pupil in translating, parsing, and scanning, as usually practised in schools. Mr. B.'s book will supply the *Desideratum* indicated by him: his plan is good, its execution highly meritorious.

7.—Recreations in Retirement; by an Old Tradesman; 12mo. Nottingham and London, 1837; pp. 348.—These are very agreeable Recreations: their characteristics are mo-

desty, sincerity and benevolence: they shew a considerable range of reading, well chosen and well digested. The author has evidently cultivated liberal principles, through the right process of observation and reflection: he is an intelligent friend of civil and religious liberty; he execrates slavery as an intolerable and inhuman abomination; and he denounces republican government as an unnatural system, tending inherently to practice the worst kinds of cruelty and despotism. The Old Tradesman's subjects are forty-one in number, and deserve every encouragement, both on account of their objects and their intrinsic merits.

9. A History of British Quadrupeds, including the Cetacea, illustrated by nearly 200 wood-cuts, by Thomas Bell, F.R.S., 8vo., London, 1837; No. xi., pp. xviii, 526.—Mr. Bell's History of British Quadrupeds is now complete, and it forms a contribution to British Zoology wherein the graphic fidelity of the figures, the beauty and aptness of the vignettes, and the perspicuous accuracy of the history, have never been surpassed. An analytical account of this admirable volume shall have a place in a future No. of this journal.

METEOROLOGICAL REPORT.

OBSERVATIONS.

Oct. 19.—An aurora borealis seen at half-past seven p. m., the air very soon afterwards clouded over.

Oct. 20.—A very remarkable sunset large and broad rays extending from the west to near the zenith.

Nov. 5.—6½ p.m. A deep blue sky on the N. and N.E. with some cloud and patches of a very yellow light. 11 p.m. a very brilliant steady and large aurora lighting up every thing; dark clouds towards the N. E.

Nov. 12.—6½ p.m. A very beautiful display of aurora, but overpowered by the full moon, quickly changing, large red patches, and streams reaching to the zenith.

Nov. 14.—11 p.m. Light clouds driving past from the North, occasional breaks in them, through which the moon is visible, it is clear in the west, a few stars can be seen, and several patches of a broad diffused fiery red, changing about and forming an interesting auroral appearance.

SEPTEMBER.

1887	Barometer.		Thermometer.		Day.	Remarks.	Night.	Wind.
Sep.	Morn.	Even.	Min.	Max.				
1	28.940		45	59	Fine, showers			Westerly
2	29.070	29.186	48	60	Showers			N. E.
3	29.244	29.490	45	57	Cloudy, rain	Rain		Northerly
4	29.472	29.363	46	57	Cloudy, fine, sun	Cloudy		Northerly
5	29.392	29.392	44	60	Fine, sun, clouds	Fine		N. Easterly
6	29.560	29.490	44	65	Fine, fog below, sun	Fine		Westerly
7	29.384		54	65	Clouds, sun, rain evng.	Cloudy		S. W.
8	29.466	29.422	48	64	Fine	Showers		Southerly
9	29.360	28.116	48	60	Cloudy, heavy showers	Cloudy		Vble. S. W.
10	29.384	29.370	50	63	Cloudy, fine			Westerly
11	29.206		55	60	Rain			S. W.
12	29.252	28.928	46	60	Fog, fine, rain p. m.			Southerly
13	28.600	28.670	50	60	Clouds, shrs., hvy rain	Showers		Southerly
14	28.932	29.070	48	60	Sun, showers, & wind	Rain		W. N. W.
15	29.160	29.410	42	56	Fine, sun	Clear, fine		W. N. W.
16	29.450	29.460	45	60	Rain, fine p. m.	Fine		S. W.
17	29.520	29.540	58	66	Cloudy, mild	Fine		Westerly
18	29.488	29.626	60	65	Showers	Cloudy, fine		S. W.
19	29.648	29.548	54	68	Fine, cloudy, damp	Cloudy, fine		S. W.
20	29.482	29.422	60	67	Very fine	Cloudy		Southerly
21	29.480	29.580	51	59.5	C.ouds, fog, fine	Fine		Sly. & Eastly.
22	29.616	29.626	52	62.5	Clouds and sun, fine	Fine		Easterly
23	29.648	29.690	50	61	Fine, sun	Fine		Easterly
24	29.786	29.810	46	56.5	Fine, sun	Fine		Easterly, fr.
25	29.476	29.850	44	58	Fine, clouds, sun	Fine		Easterly, fr.
26	29.812	29.708	46	57.5	Fine, clouds, sun	Fine		Calm, vble.
27	29.682	29.660	43	53	Cloudy, light showers	Fine		N. E.
28	29.634	29.595	47	54.5	Cloudy, fine	Cloudy, fine		N. E., light
29	29.582	29.520	48.5	60	Fine, fog early, sun	Fog early		E. S. E.
30	29.478	29.432	45	64	Fine, sun and cloud	Fine		Easterly, lgt.
Mean Min. 48.75 60.58 Mean Max.								

OCTOBER.

1897 Oct.	Barometer.		Thermometer.		Remarks.		Wind.
	Morn.	Even.	Min.	Max.	Day.	Night.	
1	29.290	29.516	55	60	Cloudy, fog, rain		Calm
2	29.664	29.690	52	67	Clouds, sun, fine	Fine	S. W.
3	29.602	29.472	54.5	68	Fine, sun, rain p.m.	Fine	S. W.
4	29.540	29.664	56	65	Fine, sun	Rain	S. W.
5	29.730	29.658	50.5	65	Sun and clouds	Fine	Westerly
6	29.554	29.720	50	63.5	Fine, sun, clouds	Rain	West
7	29.768	29.730	4.8	68	Fine		N. W.
8	29.684	29.768	54	61	Clouds, showers, fine	Fine	N. W.
9	29.846	29.846	45	58	Fine, sun	Fine	W. N. W.
10	29.854	29.830	50	68	Fine, clouds	Fine	S. W.
11	29.880	29.970	49	68	Fine, cloudy	Fine	Westerly
12	30.040			50	Fine, cloudy		
13	30.135	30.156	43	55	Fine, all sun	Fine, eclipse	
14	30.228	30.300	38.5	51.5	Very fine, sun	Fine	Northerly
15	30.166	30.088	40	53.5	Very fine, clouds	Fine	Northerly
16	30.008	29.900	40.5	54	Cloudy, fine	Fine	Westerly
17	29.810	29.678	46.5	56	Cloudy, fine		Westerly
18	29.626	29.840	47	60	Very fine	Light rain	W. S. W.
19	29.930	29.984	41.5	64	Very fine, aurora	Fine	Calm, vble.
20	30.074	30.150	44.5	61	Very fine	Fine	Northerly
21	30.150	30.034	50	61	Very fine, all sun	Fine, cloudy	Southerly
22	29.942	29.784	48.5	63	Very fine, showers p.m.	Fine	Westerly
23	29.568	29.538	50	59	Cloudy, showers & rain	Rain	W. & S. W.
24	29.094	29.060	47	50	Showers, thunder, fine	Cloudy	W. N. W.
25	29.336	29.588	32.5	45	Fine, clouds and sun	Haze	N. N. E.
26	29.516	29.300	37	54.5	Fine, windy, cloudy	Fine	S. W.
27	29.000	29.165	46	46	Rain and wind	High wind	Westerly
28		29.890	39	49	Fine, showers p. m.		S. W.
29	29.940	29.992	35	48	Showers	Fine	Southerly
30	29.838	29.880	43	57	Wind and rain		S. W.
31	29.898	29.000	39	48	Wind and showers	Windy	Westerly
Mean Min. 45.7			57.3 Mean Max.				

NOVEMBER.

1897 Nov.	Barometer.		Thermometer.		Remarks.		Wind.
	Morn.	Even.	Min.	Max.	Day.	Night.	
1	29.450	29.584	40	54	Constant rain		West
2	29.582	29.634	37	43	Windy and showers	Showers	West
3	29.760	29.020	32.5	44	Fine, sun, showers	Fine	Light, wstly.
4	29.960	29.578	33.5	46	Fine, showers	Fine	W. N. W.
5	29.588	29.770	37	51	Fine, aurora	Fine, clouds	S. W.
6	29.848	29.910	40	50	Fine		Calm, Wtly.
7	29.930	29.482	42	51.5	Fine, cloudy	Fine	S. W.
8	29.832	29.740	37	48	Clouds, fine, sun	Fine, clear	S. W.
9	29.632	29.526	39	52	Fine, cloudy	Fine	Light, soly.
10	29.542	29.506	47.5	55.5	Cloudy, fine	Rain	Westerly
11	29.550	29.568	47	52	Fine		N. W.
12	29.636	29.760	38.5	47	Fine, red aurora	Fine	N. W.
13	29.664	29.360	38	49	Fog and misty rain	Fine	Calm, soly.
14	29.144	29.334	39.5	44.5	Rain, red aurora	Rain	Variable
15	29.600	29.676	34	42	Fine, aurora	Cloudy	Northerly
16	29.596	29.510	35	43	Fine, cloudy	Fine	N. E.
17	29.590	29.684	28	37	Very fine	Fine	Northerly
18	29.636	29.668	29	44	Clouds, light showers	Fine	Westerly
19	29.480	29.390	40	53	Cloudy, rain		S. W.
20	29.374	29.390	39	48	Fine, clouds, showers	Cloudy	Northerly
21	29.372	29.530	35	44	Windy and showers		W. N. W.
22	29.400	29.366	43	54	Cloudy, light rain	Rain	S. W.
23	29.220	29.330	50	52	Rain, fine in evening	Clouds & wind	S. W.
24	29.492	29.550	39	46	Fine		Calm, wstly.
25	29.684	29.790	35	43	Very fine, all sun	Fine	Northerly
26	29.500	29.086	33	48.5	Wind and showers	Fine	S. W.
27	29.126	29.968	35	44	Fine, showery		Southerly
28	29.900	29.842	39	42.5	Cloudy, light rain	Fine	W. N. W.
29	29.146	29.268	32	38	Fine, sun	Fine	Northerly
30	29.172	29.090	32	49.5	Cloudy, rain		S. W.
Mean Min. 37.5			47.1 Mean Max.				

INDEX.

- Adam Afzelius, 165
 Addison's Lecture on Natural History, 188
 Aeronautical Expedition, 129
 Alpine Forests, 159
 Alpine Pasturage, 157
 American Pigeon, 139
 Amonites, 199
 Anatomy, knowledge of, necessary for the preservation of health, 77
 Anecdote of Bach's perseverance, 6
 Angus, Charles, murder of Miss Burns, 31
 Apparatus for withdrawing Atmospheric Pressure, 339
 Architecture, beauties of, 200
 Argonauts, 148
 Artemisia, Queen of Caria, 172
 Artemisia, the Plant, 173
 Association for exploring Central Africa, 95

 Bach, l'art de la Fugue, — and his Works, 3
 Baden-Baden, its Situation and Thermal Springs, 106
 Badger, The, 154
 Basilisk, The, 151
 Bible, the Literary Beauty of, 297
 Birmingham Musical Festival, 237
 Boll, with its sulphureous Spring, 110
 Botanical Geography of the South of Europe, 50
 Botanists whose Names are commemorated in the Appellations of Plants, 171
 Botany, its Divisions, 193
 Boughton, Sir T., case of Poison, 23
 Burdock, M. A., convicted at Bristol, 28
 Buswell, Judith, Murder of, 30
 Blyth's Ornithological Lecture, 312

 Caloricity of Mineral Waters, referable to Electrical Causes, 108
 Campsall Society, 99
 Cape of Good Hope Association, 96
 Care in the choice of a Preceptor for Youth, 65

 Carlsbad and the Bohemian Spas, 115
 Carnstadt Waters, 109
 Chiron the Centaur, 174
 Chironia Centaurium, the Plant, 176
 Church Music, 149
 Circumstantial Evidence, Essay on, 19
 Cirl Bunting, the 357
 Classification of Birds by different Ornithologists, 134
 Coal Gas used in inflating Balloons, 130
 Coal Basins, Origin of, 248
 Combe's System of Phrenology, 84
 Corpus delicti, Cases difficult to ascertain, 21
 Crania of Birds, 140
 Crania, found in the Ancient Mounds of North America, 336
 Critical Notices of New Publications, 102, 292

 Development of Musical Genius attributed to Hereditary Influence, 57
 Divi Botanici, 171
 Distress of this Country, Causes of 209
 Dorset, Earl of, Letter from, 277
 Donovan, E. (F.L.S.) 165
 Downing, Case of Mrs., poisoning, 26

 Education, as it is and as it should be, 63
 ———— 73
 ———— cannot compensate for Natural Deficiencies, 76
 Effect of Climate on different Individuals, 111
 Effects of the Expansive Power of Balloons at suddenly increased elevations, 132
 Ehrenberg, upon Fossil Infusoria, 60
 Elliotson's, Dr., Remarks on Phrenology, 84
 Encroachment of the Sea, 341
 Entomological Society, 91
 Erroneous Conviction, Cases of, 20
 Excursions through the Highlands and Isles of Scotland, 123

- Expression in Architecture, 202
 Extracts from Foreign Journals, 163
 Flora Metropolitana, 143
 Fossil Infusoria, 60
 Franzenbad, with its Gas and Mud Baths, 121
 Fossil Remains, 342
 Gall's Discoveries, 149
 Garden Thrush, 150
 Gastein, its Warm Baths, 113
 Geological Excursion by Professor Phillips, 163
 Geology, 341
 Glaciers, Mechanism of the Motion of, 340
 Observations on the Structure of Kent, 85
 Genius, with its Results, 10
 Gould's "Birds of Europe, 135, 353
 Granville on the Spas of Germany, 102
 Griesbach and Rippoldsau Mineral Water, 107.
 Harmony and Melody combined, 12
 Heart, The, erroneously supposed the Seat of the Mind, 71
 Helebre, 180
 Henry, Prince, Son of James I., supposed murder of, by poison, 280
 Ichthyosaurus, fossil, found at Barrow, 233
 Ideality the soul of Art, 212
 Infusoria, variety of, 61
 41,000,000,000 (!) in a cubic inch, 62
 in the Waters of Carlsbad, 118
 Insects, destruction of, by means of bruised Laurel leaves, 148
 Intellectual Monstrosity, 240
 Irvin's Inaugural Address to the Leicester Society, 320
 James I., Character and Conduct of, 267
 Jones's Lecture at Staines, 142
 Journal of a Horticultural Tour through Germany, &c., 128
 King Fisher, The Common, 340
 Kingly Power, Abuse of, by James I. 284
 Lawrance's Lecture on fossil Fruit, 327
 Language not Knowledge, 78
 Leighton's Catalogue of Cryptogamous Plants, 161
 Levison's Letter, 89
 Lias, its geographical position, 234
 Lienbensall, 109
 Link's Contributions to the Botanical Geography of the South of Europe, 50
 Literary Intelligence, 166
 Leicester Literary and Philosophical Society, 320
 MacGillivray's "British Birds," 133
 Man cannot Cultivate all his Powers equally, 78
 Manton, Master William, the Infant Paganini, 56
 Marten, Maria, Murder of, 32
 Marine Animals in the Stone of the Isle of France, 62
 Melampus the Prophet, 177
 Melampodium, the Plant, 180
 Marienbad, 120
 Meteorological Report, 169, 350
 Microscopic experiments on Conserve thermales and Schlegm, (bath slime) 115
 Mineral Waters act as Alternatives, 103
 Mode of regulating the Attitude of Balloons, 139
 Monk Mason's Aerial Expedition, 129
 Mounsey, Miss, Duet by, 145
 Mourg, Valley of the, 107
 Mr. —, case of attempting to Poison his Wife, 33
 Mud Baths, The Antiquity of, 103
 Munich, 111
 Musical Education, Present state of, 18
 Musical Precocity, 54
 Festivals, sources of the highest mental gratification, 210
 Music, Instrumental, 145, 307
 Bennett's Romances for the Piano-forte 311
 Vocal, Chants by Havergal, 143
 Catechisms, 150
 derived from Nature, 210
 calculated to promote devotion, 215
 Natural History, General View of the Subjects of, 188
 Nassau Spas, 122
 New Publications, 167
 Nodules, Probable Cause of Formation of, 239

- Oats, Variety of with edible Fruit, 53
 Obituary 165
 Organology confounded with Phrenology, 83
 Organised Beings, 151
 Ornithology, European, Sketches of, 35, 253
 Ornithological Society of London, 199
 312
 Observations on the South Staffordshire Coal-field, 237

 Pass of the Stilvio, 159
 Pearls, Formation of, 198
 Phillips, the Infant Trumpeter, 54
 Phrenology, System of, 84
 Pigeons, and their Faculty of Locality, 141
 Pineapples at Genoa, 152
 Pine, Grecian, 53
 Pinus halepensis, 52
 ——— pinaster, 53
 Pityocampas, the Bandit, 53
 Plants indicating difference of longitude, 52
 Popular Considerations on the Use and Power of Mineral Waters, 103
 Poriphera, Structure of, 194
 Powers of Man limited, 77
 Practical Ornithology not cruel, 138
 Proceedings of Societies, 91, 312
 Progress of the Pupil mainly dependent on the Teacher, 78
 Prussic Acid, Effects of on a Rabbit, 151
 Rules for the Use of Mineral Waters, 104
 Radiata, 194

 Sandstone at Rugen and Geneva, 50
 Schrada, H. N., 165
 Sea Grape, 343
 Seb. Bach and his Works, 3
 Shaw the Organist, 56

 Shrewsbury, Memorials of, 141
 Silence on the Ocean, 132
 Siliceous Concrete of Franzenbad, 60
 Sketch of Bach's Life, 6
 Smith's Excursions in the Highlands, 123
 Sprudel, 115
 Staine's Literary and Scientific Institution, 97
 South Staffordshire Coal-field, 237

 Teal, Common, 36
 Theory of Music, 150
 Teucer, 183
 Teucrium, the Plant, 186
 Threlkeld, Dr., Notice of, 296

 Vasculares, 193
 Vocal Works of Bach, 13
 Vegetable Physiology, 342
 Vertebrata, 194, 199
 Veneration, Misdirected, 214

 Warping Land in Lincolnshire, Method of, 87
 Warwickshire Natural History and Archeological Society, 92
 Webbe's Fugues for the Organ, 148
 Whortleberry well adapted to indicate the elevation of the Surface, 50
 Wildbad Baths, 107
 Watson's "Botanical Guide," 292
 Wesley's "Funeral Anthem for the Organ, 307
 Wills, On Circumstantial Evidence, 19

 Yarrell's "British Birds," 141
 York and Birmingham Organs, Relative size of, 337

 Zoology the most Interesting Subject, 75
 ———, its four Divisions, 193

END OF VOL. VII.

